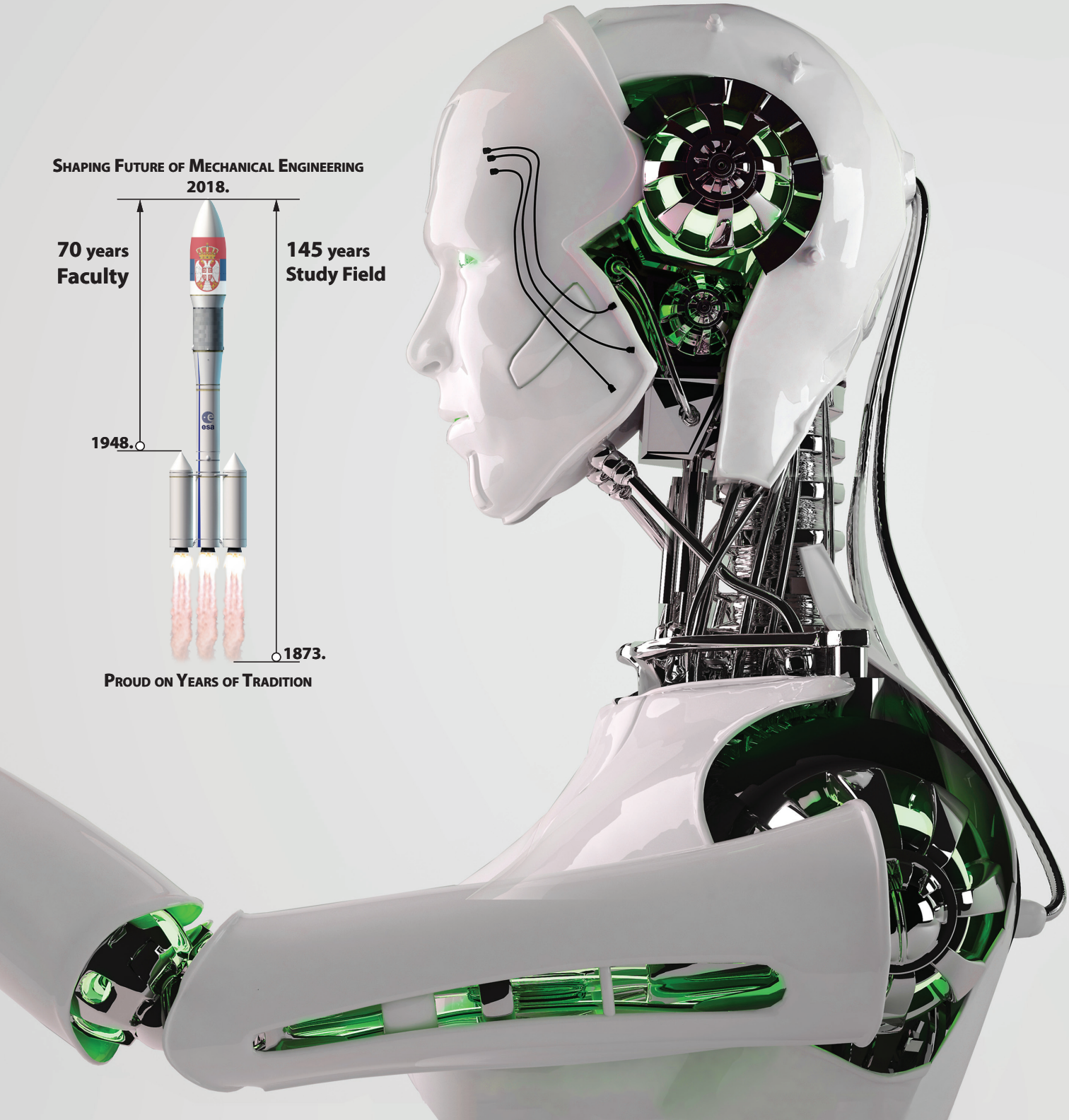
MECHANICAL ENGINEERING

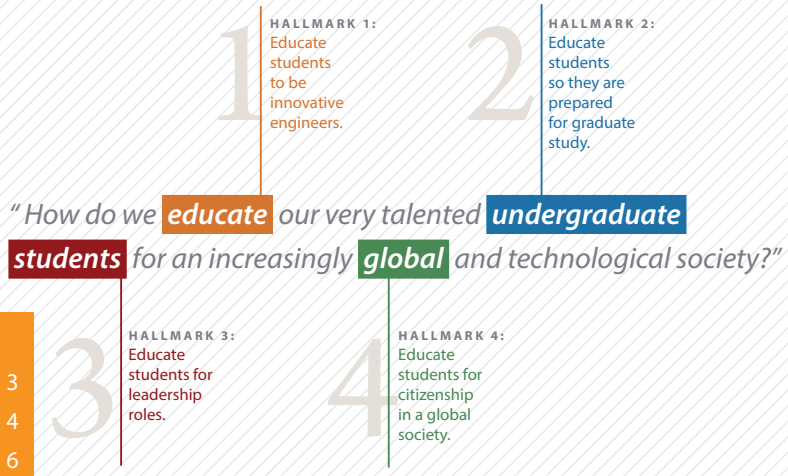
@ UNIVERSITY OF BELGRADE

210 UNIVERSITY OF BELGRADE 1808-2018

УНИВЕРЗИТЕТ У БЕОГРАДУ • МАШИНСКИ ФАКУЛТЕТ •



Contents



DEANS
THROUGH
70 YEARS
OF THE FACULTY HISTORY

MESSAGE FROM THE DEAN

Dear Reader,

This year is especially important to our home institution – University of Belgrade – but to our Faculty as well. Namely, in the year 2018, we celebrate three anniversaries: 210 years of the University of Belgrade, 145 years of Mechanical Engineering at the University of Belgrade, and 70 years of establishment of the Faculty of Mechanical Engineering as an independent institution. Therefore, this is a great opportunity to publish the third edition of this booklet. The content of this particular edition has been enriched by contributions about our academicians, international projects, laboratories, equipment, as well as the newly formed departments, and it is a reflection of the success achieved by previous generations over the past seven decades. I am certain that you will enjoy the journey through our activities, specializations, departments, history, facts, figures and much more.

The main mission of our Faculty - education of top class engineers - has been successfully accomplished during the last 70 years by the production of new knowledge through scientific and research activities, international cooperation and collaboration with industry, and incorporation of this knowledge into the teaching process. Our Faculty has a long history of excellence at all levels of education - we offer bachelor, master and doctoral degrees in mechanical engineering. Some of our departments and study specializations are unique in the Balkan region, for instance aerospace engineering, industrial engineering, computer science in mechanical engineering, naval architecture, etc. We focus on high-quality, student-centred education and, over the last years, we moved from traditional education, relying on proficiency in specific engineering disciplines and curricula, to a new paradigm of proficiency based on flexible and interdisciplinary studies, in accordance with the principles of Bologna Declaration.

Our goal is also to complement our educational assignment with a very important mission – the mission oriented towards the rapid development of the society on the basis of latest technologies, knowledge-based economy and advanced interactive systems, usually defined as Industry 4.0. In this context, the main ambition of our Faculty is to lead the way in order to find a specific place for Serbia in the globalized world, which would enable high-tech development and a better living standard. The leading experts in the field of production planning are confident that our country has significant potentials to join the global industrial community. Experiences of other countries are precious for us as a guide not only for a new "road map" of our industrial development, but also as the direction for further development of education and science in Serbia.

Bearing that in mind, successful managers of major companies and researchers from the leading universities are frequent participants in panels, lectures and conferences organized by our Faculty, as a way of informal education of future engineers. Additionally, the experience of our alumni with brilliant international careers is very important to us. We have more than 22,000 alumni worldwide, many of whom have assumed very high academic positions as academicians, vice-rectors and deans; there are also famous researchers in national research laboratories, CEOs or presidents of national and international companies and heads of government agencies; some of our alumni even hold political positions as prime ministers, deputy prime ministers, government ministers, etc.

In this way, we strive to create an environment in which students are well aware that knowledge gained through the exceptional system of formal, but also non-formal and informal education, represents their main intellectual capital, which will provide them a safe and successful professional career.

All the above-mentioned has contributed to the creation of a completely different climate in the approach to teaching and extracurricular activities, and, consequently, to a much greater interest of young people in mechanical engineering studies.

We are all aware that only with openness towards new ideas, knowledge, methods and technologies we can gain better international visibility of our Faculty which corresponds to its current status in the region of South-East Europe. And our major goal in the following period will remain the same: to provide the best education for future mechanical engineers, fully prepared to respond to the latest technological challenges of the globalised world of industry and science.

Finally, we would like to invite you to visit our website and view our day-to-day activities and follow our progress. Let us work together to keep our Faculty in the leader position – not only at the national, but at the regional and international level as well. Your comments and feedback are more than welcome.

Prof. Dr. Radivoje Mitrović, Dean the 24th
University of Belgrade, Faculty of Mechanical Engineering

History

Tradition and Excellence through History

Mechanical Engineering at University of Belgrade

1808 | 1863 | 1873 | 1897

1808

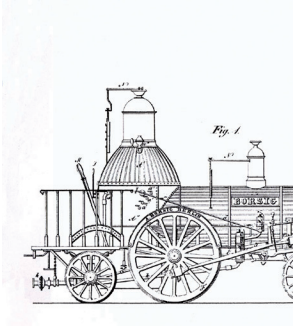
Grand School

210

UNIVERSITY OF BELGRADE

1808-2018

Technical Faculty on the Grand School

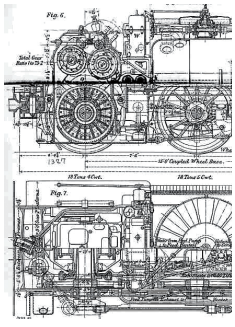


1863

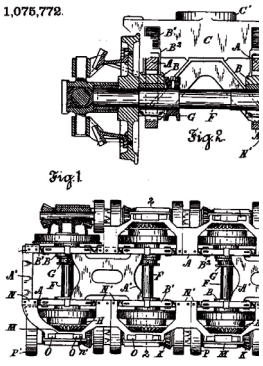
1873

The first course titled: Mechanics and the Science of Machines

145 years



Mechanical-Technical department

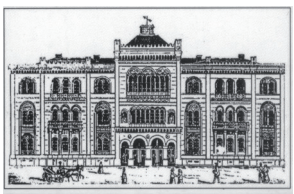


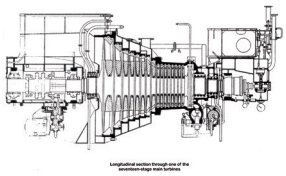
1897

1905 | 1948 | 1960 | today

1905

Grand School became University





Longitudinal section through one of the seventeen-stage main turbines

Proclamation of the Faculty of Mechanical Engineering

70 years

1948

1960

Start in the new building

today

The City of Belgrade

Beograd
www.beograd.rs

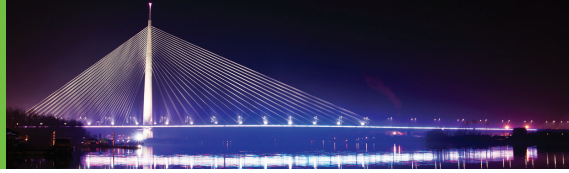
Belgrade is the capital of the **Republic of Serbia**, **well known** for its abundant **vitality**, sense of **humor** and **curiosity**. The city which has **much to offer** to its **student population**.

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.

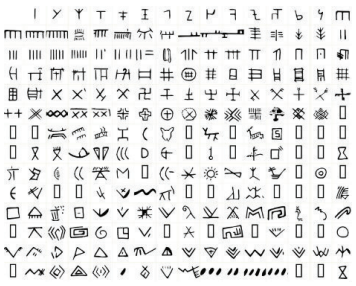
In Knez Mihailova street, in front of the buildiing of Serbian Academy of Sciences and Arts, the coordinates of Belgrade are marked: 44°49'14" of northern latitude, 20°27'44" of eastern longitude and an altitude of 116.75 m.

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.

The Vinča culture flourished from 5,500 to 3,500 BC. Archeological site Belo Brdo is close to the present-day village of Vinča, suburbian part of Belgrade on the Danube river, where over 150 settlements have been excavitated. There is no evidence of war or defences in



the townships, and it appears that the Vinča were a peaceful society combining low-level agriculture with foraging (mostly fishing) and goods trade. They produced the first known European examples of a 'proto'-script and were the first people in the world known to melt copper, thus being the first European Metallurgists.



The First European Writing - Vinča script.

Fishlike human head sculpture from archeological site Lepenski Vir, on Danube bank 130 km downstream of Belgrade confluence.

Various styles of zoomorphic and anthropomorphic figurines are hallmarks of the culture of Lepenski Vir which is of the same historic period as Vinča.

In its long and tumultuous history, Belgrade had often changed both its names and its rulers. As of the third century, when the Celtic tribe Scordisci had set up a stronghold Singidunum at the confluence of the Sava river into the Danube, the city at the "crossroads of the worlds" had been conquered by the Byzantines, the Gepidae, the Sarmatians, the Eastern Goths, the Slavs, the Avars, the Francs, the Bulgarians, the Hungarians, the Ottomans, the Austrians, the Germans... Each of the conquerors also used to give it their respective names: Singedon, Nandor, Fehervar, Nandor Alba, Alba Graeca, Grieschisch Weisenburg, Alba Bulgarica, Taurunum, etc. However, its Slavic name – Belgrade has lasted longest. The British Encyclopedia of Cities mentions that it is the city about which the greatest number of battles had been waged, but also the city with the greatest number of symbolic names: The Hill of Battle and Glory, the Hill for Meditation, the House of Wars, the Egypt of Rumelia, the House of Freedom, the Gateway of the East – the Gate of the West...

In recent history Belgrade suffered two heavy bombings during WW-II, one by Germans in April 1941 and the other by "allies" for the Easter in April 1944, and 78 days of heavy NATO bombing in 1999.

"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.

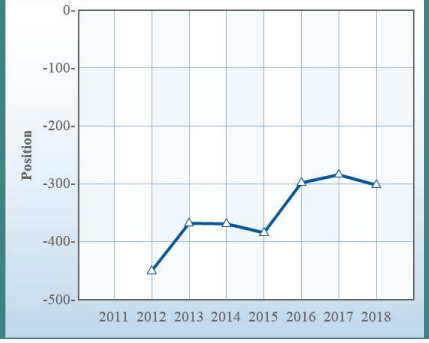
And in every time of year frequently come the days when the flame of that sun setting in the plain, between the rivers beneath Belgrade, gets reflected way up in the high celestial dome, and it breaks there and pours down over the scattered town. Then, for a moment, the reddish tint of the sun paints 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

University of Belgrade

around 300th place in the world

(ARWU Shanghai list)



"Knowledge is the golden ladder over which we climb to heaven; knowledge is the light which illuminates our path through this life and leads to a future life of everlasting glory"

"From Immigrant to Inventor" (1925), Pulitzer winning book by Mihajlo Pupin

Ph.D, Serbian born physicist and inventor of Pupin's coils in electrical engineering, Professor emeritus at Columbia University

History

The origin of the University of Belgrade can be tracked down to the beginning of the 19th century, when Dositej Obradović founded the College in 1808.

On September 24, 1863, the Law on the Advanced School Founding was adopted. It was by power of this Law that the Lyceum was transformed into the The Higher School. This institution was situated in the edifice that one of the wealthiest Serbs of the time, Captain Miša Anastasijević, had bequeathed to his fatherland. The Higher School was well recognized not only in Serbia, but also throughout Europe. The most prominent teachers of this School had been educated at the leading foreign universities and they continued to cooperate with their former tutors and colleagues as the representatives of their respective departments.

Early in 1905, the Act on Universities was enacted, and King Peter I signed the decree of its coming into force. It granted the University autonomy, stating that "the teachers are free to present their knowledge". The University of Belgrade was the most important academic institution of the Kingdom of Yugoslavia. Not only was it the heart of scientific, educational and cultural life, but also the centre of resistance to totalitarism. The University gained its reputation through the work of Milutin Milanković, Vladimir Ćorović, Đorđe Tasić, and others.

Modern Days

In the academic year 2013/14, 90.000 undergraduates were enroled. Only the students who pass entrance exams and have an adequate high school score can matriculate the University.

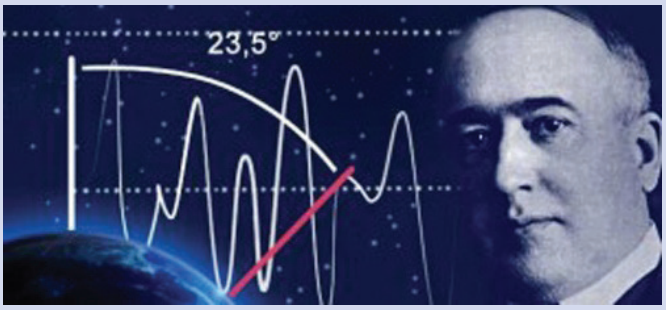
Graduate studies were organized in the 1950s so that students could advance towards the Master of Sciences degree which, from 1966 on, became a precondition for defending Doctoral thesis.

After a decade of international isolation during the 1990s, the University of Belgrade swiftly came back into the international academic community. It became a member of European and International University Association and was also included into various forms of inter-academic cooperation (such as TEMPUS projects and UNIADRON initiative). Nowadays, the University of Belgrade is a state university and is ready to maintain and improve its role of the leading higher education institution in the area, preserving the traditional values which make it recognized as a prime national brand, but also constantly adapting to new challenges.

Endowments and Funds

There is a long tradition of endowing properties and funds in Serbia. Many distinguished and affluent Serbs have endowed their properties to the University of Belgrade.

Famous Serbian Scientists and Innovators



Milutin Milanković, Serbian civil engineer, doctor of technical sciences and university professor, best known for his theory of ice ages, relating variations of the Earth's orbit and long-term climate change, now known as Milankovitch cycles.

Born in 1879 in Dalj in a Serbian merchant family in former Austro-Hungary. Died in 1958 in Belgrade.

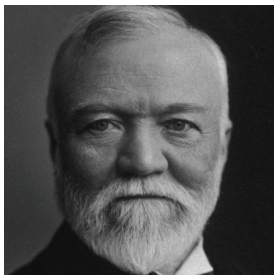
At age of 25, defended his doctoral thesis at TU Vienna and proudly became the first Serbian Doctor of Technical Sciences. Worked for an engineering company in Vienna, using his knowledge to design structures. Obtained several patents relating to methods of building with reinforced concrete.

In 1909, became university professor heading the 'Chair of Applied Mathematics' at the University of Belgrade. Lectured on rational mechanics, celestial mechanics and theoretical physics, doing in parallel his scientific research.

http://en.wikipedia.org/wiki/Milutin_Milankovi%C4%87

University Library "Svetozar Marković"

University Library "Svetozar Marković" is the oldest and largest university library in the country and the central library of the University of Belgrade. The building is the **endowment of** Andrew Carnegie world fameous philantropist. It is one of his only 3 public libraries in continental Europe (the other two are in Leuven, Belgium and Rheims, France). *http://en.wikipedia.org/wiki/List_of_Carnegie_libraries_in_Europe*



Andrew Carnegie

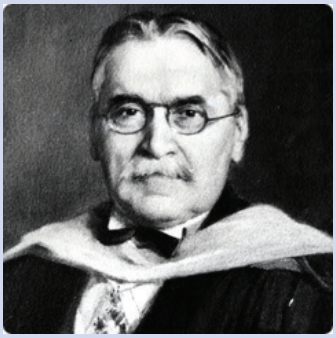
The design project for the building was created by University of Belgrade professors Nikola Đorđević and Dragutin Nestorović.

Library was officially opened on St. Cyril and Methodius Day, 24 May 1926.

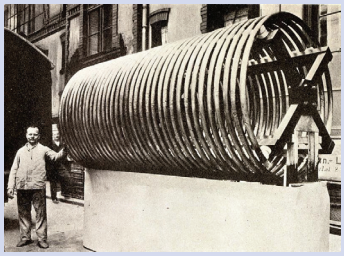
Andrew Carnegie, 1835-1919, was the richest man in the world of his time. Coming as a poor kid from Scotland to the U.S. by the 1880s he'd built an empire in steel (Carnegie Steel Co. today's U.S. Steel Co.), sold it to J.P. Morgan for $480 millon and then donored $60 million to fund a system of 2,500 public libraries across the world (he also had invesments in founding of Carnegie universities, famous Carnegie Hall in NYC, other thrusts and endowments). To build and equip the library in Belgrade he donated $100.000. In turn, Belgrade city assigned the land for the library and named a street next to the library after Carnegie's name.

The library is intended primarily for students, teachers and researchers, but is open to all citizens. Its collection consists of the scientific and special publications, mostly in foreign languages, as well as electronic publications which can be accessed via the Academic Network and National library through specilazed service *kobson.nb.rs* financed by the Ministry of Science.

Mihajlo Pupin, Serbian-American physicist and inventor, was born in village Idvor in former Austria-Hungary empire (today part of Serbia) in 1858. Michael Pupin immigrated to the United States in 1874, graduated from Columbia University in physics in 1883, and obtained his Ph.D. at the University of Berlin in 1889. Pupin taught at Columbia University for more than 40 years, 30 of them as a professor of electromechanics. Died in 1935 in New York.



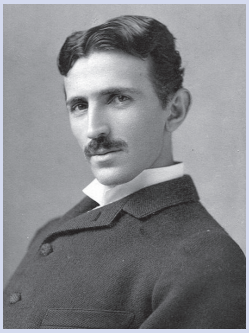
Michael Idvorski (after his birthplace) Pupin improved the quality of long-distance telephone and telegraph transmission by inserting coils in the long lines at intervals; he discovered that matter struck by X-rays is stimulated to radiate other X-rays (secondary radiation) and invented an electrical resonator. Michael Pupin received 34 patents for his inventions, and he won the Pulitzer Prize in 1924 for his autobiography, "From Immigrant to Inventor".



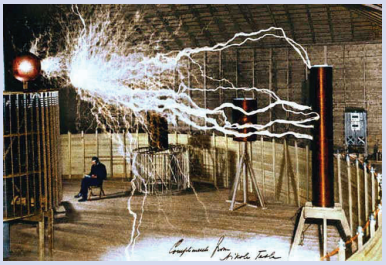
Pupin was a founding member of National Advisory Committee for Aeronautics (NACA) on March 3, 1915, which later became NASA.

http://en.wikipedia.org/wiki/Mihajlo_Pupin

Nikola Tesla, Serbian-American inventor was born in 1856 in village Smiljan in former Austria-Hungary empire. He was the son of a Serbian Orthodox clergyman. Tesla studied engineering at the Austrian Polytechnic School, then worked as an electrical engineer in Budapest and later emigrated to the United States in 1884 to work at the Edison Machine Works. He died in New York City on Christmas Day January 7, 1943.



During his lifetime, Tesla invented fluorescent lighting, the Tesla induction motor, the Tesla coil, and developed the alternating current (AC) electrical supply system that included a motor and transformer, and 3-phase electricity.



Tesla is now credited with inventing modern radio as well; since the Supreme Court overturned Guglielmo Marconi's patent in 1943 in favor of Nikola Tesla's earlier patents. The Tesla coil, invented in 1891, is still used in radio and television sets and other electronic equipment.

In 1960, in honor of Tesla, the General Conference on Weights and Measures for the International System of Units dedicated the name "Tesla" to the SI unit measure for magnetic field strength.

http://en.wikipedia.org/wiki/Nikola_tesla

Studying Mechanical Engineering @ University of Belgrade

“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.
In addition to classical teaching methods, more and more courses on UB-FME introduce computer and electronically assisted teaching methods through Moodle, video conferencing and other contemporary learnign tools.

Study Mobility
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.

Admission Procedures and Standards

International students follow essentially the same procedures as all domestic students in applying for admission. The admissions procedure ensures that applicants fulfil the necessary requirements to study at the highest level at the Faculty of Mechanical Engineering at University of Belgrade.

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 and post-graduate international students are strongly advised to have a minimum of €5,200 per annum in addition to tuition 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.

General Entry Requirements

for a Bachelor's degree:*

» a secondary school-leaving certificate (also known as High School Diploma, Matura, A-Levels, Bachillerato, Atestat, baccalauréat)

» proof that student have passed the Faculty of Mechanical Engineering entrance examination

» * Serbian: Bachelor's degree courses are only thought in Serbian, and students are required to prove that they have an adequate knowledge of Serbian. Students can do this by taking Serbian language proficiency tests (please contact our admission department for additional information on Serbian language preparatory courses).

for a Master of Science degree and PhD programmes:

Applications to M.Sc. and Ph.D. tracks are accepted from persons who have completed a B.Sc. degree for entrance into the Master's program or a M.Sc. degree for entry into the Ph.D. program. Most incoming students have a degree in mechanical engineering or related branch of engineering. However, the Faculty's admission criteria are not specific and capable students with backgrounds in various branches of engineering or in science may gain entry.

Necessary documents:
» Minimum of two letters of recommendation
» Uploaded official copies of transcripts
» English fluency - IELTS or TOEFL for international students whose native language is not English. Minimum acceptable score for IELTS = 6.0; TOEFL = 80 IBT, 215 CBT, 500 PBT

When to Apply

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

Experience with international students

Since its start as an independent faculty, in the past period 1948-2005, at UB-FME the system of studies was: integrated 5 years for Dipl.-Ing., additional two years of study for Mgr (old MSc) and just research and thesis defense for PhD. Studies were in Serbian, while for PhD - English was also preformed. In such a system, 260 international students from 26 foreign countries received the Dipl.-Ing. degree (Iraq-129, Jordan-31, Greece-17, Syria-15, Algeria-10, Libya-8, Cyprus-6, Poland-5, Lebanon, Indonesia and Sudan – 4 each, Hungary, India and Ethiopia – 3 each, Austria, Palestine, Ghana, Kuwait, Zaire and Nepal – 2 each, and Germany, Tanzania, Egypt, Sri Lanka, Bolivia and Rwanda – 1 each, republics from former Yugoslavia not counted), 46 got the Mgr degree and 26 defended PhD theses.

In post-Bologna period, since 2005 up to date, the system of studies on UB-FME is: 3 years for BSc, 2 years for MSc (Dipl.-Ing.) and studies of 3 years for PhD (in fact old studies for Mgr plus research and PhD defense). In such a system, besides studies in Serbian, the UB-FME organizes studies in English on all levels. On studies in English, there are currently 10 international students on MSc and 30 on PhD level. Until now, 4 international students defended their PhD theses finishing PhD studies in English and 10 got the MSc degree. These students are mostly from Libya, Pakistan, Sudan, Iraq and UAE).

Visas

Serbian Visas are issued on producing the following official documents: Valid passport with a validity of upto 6 months on completion of stay in Serbia; Visa application form obtained at the Embassies or Consular Missions of the Republic of Serbia; Letter of acceptance from University of Belgrade; Passport size photo; Medical Examination Report; Proof of Sufficiency of funds and Travel health insurance.

Visa processing takes about three weeks. All regulations consular fees or services are subject to change without any prior notice.

Students at partner universities can study for one or two semesters at the Faculty of Mechanical Engineering at University of Belgrade as part of an ERASMUS or direct exchange program.

Study as a GUEST STUDENT !

International students are not invited just for studying the whole prrogram in English at the Faculty, but also for the part of it. After getting international accreditation and EUR-ACE label, UB-FME is strongly offering to European students the possibility of studiyng one semestar in Belgrade, through fully recognizable ECTS system and programs internationally accredited. In accordance with the Bologna principles, students from European countries have the opportunity to spend one or more semesters at the UB-FME, attend lectures and take exams, learn the local culture and habits. The international cooperation is accomplished through the ERASMUS MUNDUS and CEPUS programs, which imply the exchange of students and academic staff. There were several such students in the past (mostly due to financial restrictions and prejudices), but this activity is now expected to be much more broadened.

National accreditation limits do not apply for studies in English, so international students have the wide possibility to be accepted for the kind of studies they would prefer.

Students studying on UB-FME have also the possibility to study abroad through the same exchange programs, and also to finish the internship through well-established IAESTE program. Also, some departments organize national and international excursions for students, thus making them acquainted with industry colleagues and facilities. Skill praxis (internship), as a part of study program, may also be performed in such manner.

Guest Student Requirements

International guest students can also apply to study for one semester at the Faculty of Mechanical Engineering without being part of a specific exchange program.

After consultation with the department in question, guest students can attend courses and lectures and acquire credit points.

To apply as a guest student, student have to be enrolled in a program at his home university and a faculty member in a comparable program at the Faculty of Mechanical Engineering must act as his supervisor for the duration of stay.

Guest students cannot attain a degree from the Faculty of Mechanical Engineering at University of Belgrade.

Financial Information

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 govermentally 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 2013/14 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

Learning Centre

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 rusticaly 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 UB-FME network is built in the "star" topology, type "fast ethernet". Main router is Cisco Catalyst 3550 with 24 100Mb-ports and 1Gb-port (Faculties connection to European academic network).

All students are issued with a computer username and password when they join the Faculty; this allows them to use one of 180 PCs in computer rooms (5 rooms with 20 PCs, 7 rooms with 10 PCs and AutoDesk branded room with 10 PCs).

The latest versions of subject-specific software are provided, including statistics (Matlab) and engineering drawing and modelling packages (AutoCAD, CATIA, SolidWorks, ProEngineer, etc). Ph.D. students can use 8 powerful computers for parallel programming at SimLAB (donation of German universities, HRK).

Visiting professors and students can access European academic network over "eduroam" service at 3 access points.

Many laptop docking points will be given all across the Faculty. In addition, the Faculty will be extensively equipped with WiFi 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 provided for students.

Our facilities include a fully-equipped video conferencing suite at recently upgraded fifth floor.

Accommodation and Hospitality Services

Living in Belgrade

Where to stay?

If you decide to rent an apartment in Belgrade, it will cost you the same as about anywhere else in Europe, if you chose an apartment in the suburbs. However, it might take you between 40 minutes and one hour to reach the Faculty premises. If you choose to rent an apartment in the center, prices are a little higher, but you will enjoy the vibrant life Belgrade has to offer.

There are 11 student residencies in Belgrade, including Studentski Grad, which, in addition to dormitories and a restaurant, has two libraries, a cinema and a theater building, conference halls and an open stage for summer concerts. Student residencies are vibrant places, where you can live, eat, study and meet new friends and colleagues.

Accommodation in student dormitories is possible, the price ranges from 90 to 110 Euros per month. Please note that there is a selection process involved. Application forms will be available in November. If you want to feel the true spirit of student life in Belgrade, come and live in one of the many student dormitories!

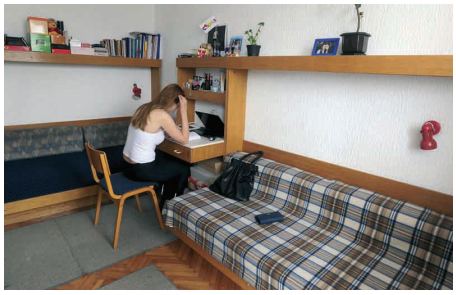
List of dormitories:

- "Studentski grad" - Address:143 Tošin Bunar, 11070 New Belgrade; Phone:+381 11 2699 302
- "Slobodan Penezić" - Address:Ban Ivaniš bb, 11000 Belgrade; Phone:+381 11 412 638
- "Kralj Aleksandar I" - Address:75 Kralja Aleksandra Boulevard, 11000 Belgrade; Phone:+381 11 401 800
- "Patris Lumumba" - Address:1 Dragice Pravice Street, 11000 Belgrade; Phone:+381 11 751 977
- "4. April" - Address:320 Vojvode Stepe, 11000 Belgrade; Phone number 1:+381 11 3976 307
- "Karaburma" - Address:7b Mije Kovačevića, 11000 Belgrade; Phone number:+381 11 750 962
- "Košutnjak" - Address:156 Blagoja Parovića Street, 11000 Belgrade; Phone number:+381 11 3559 747
- "Rifat Burdžević" - Address:77 Milana Rakića, 11000 Belgrade; Phone number 1:+381 11 2413 435
- "Vera Blagojević I and II" - Address (Vera Blagojević I):48 27. marta Street, 11000 Belgrade; Phone number:+381 11 324 6663
  Address (Vera Blagojević II):37 Dalmatinska, 11000 Belgrade; Phone number:+381 11 759 943
- "Žarko Marinović" - Address:254 Cara Dušana, 11080 Zemun; Phone number 1:+381 11 618 003
- "Mika Mitrović" - Address:33 Kralja Vladimira, 11000 Belgrade; Phone number: +381 11 3970 283

More info at *www.bg.ac.rs/en/students/appartments-dormitories.php*

When do students apply for dormitory accomodation?
Please refer to our students councelor 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.rs/
Email: mf@mas.bg.ac.rs, dekan@mas.bg.ac.rs

Does student room have internet connection?
There are LAN and WiFi connections in many residences but in some of them you will have to use 3g to connect to the Internet.



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.

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.rs*, as well as in other public and private institutions.

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.rs/
Email: mf@mas.bg.ac.rs, dekan@mas.bg.ac.rs

Semester & Exam Dates

Winter (Autumn)
Semester: September 30 - January 17
Exams: January 27 - February 23

Summer (Spring)
Semester: February 24 - May 30
Exams: June 9 - July 6, September 1-28

For full details please visit the website:
http://www.mas.bg.ac.rs/

www.mas.bg.ac.rs

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 (+381-11-33-70-350) or email (mf@mas.bg.ac.rs) and we will arange the visit.

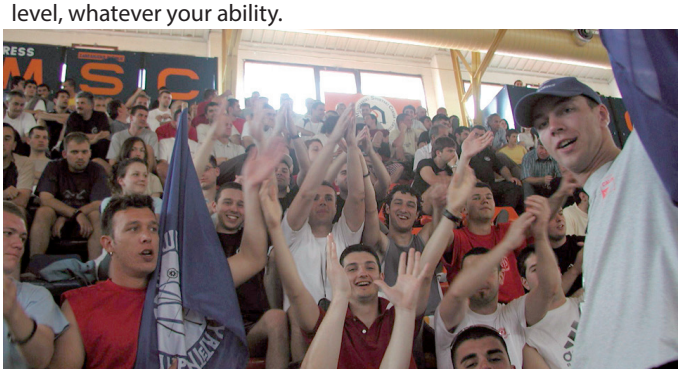
After you apply
If the department you have applied to offers you a place or an interview (for postgraduate students only), they may invite you to a departmental open day door where you will have the opportunity to meet students and staff and attend specific talks and tours.
For further information please contact us.

Info journal of the Faculty

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.



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

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.

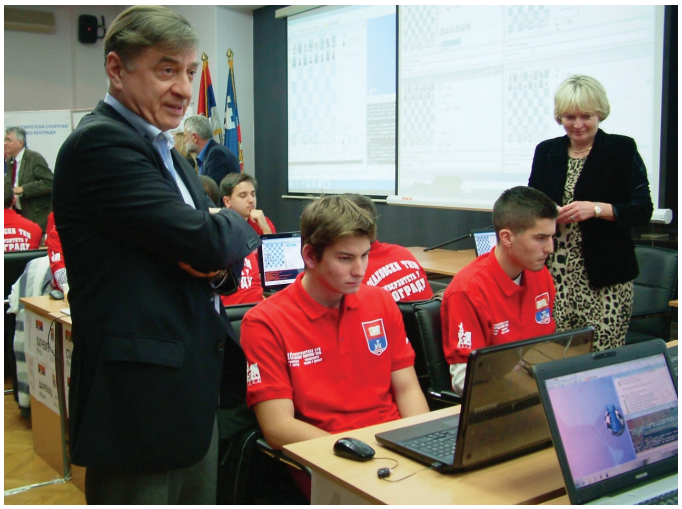
Each spring UB-FME students participate at the regional, mechanical engineering students gathering, famous "Mašinijada".

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

Trans-Atlantic Rivalry

Since 2006 Faculty is the host to online distance chess match between the students of the University of Belgrade and University of Texas at Dallas. From 2012 championship holds a name - Trans-atlantic Cup Svetozar Gligoric. Several of our students are on the University team. Current status of this battle for Trans-Atlantic Cup is that University of Texas in Dallas is leading by 7.5:5.5.



University of Belgrade Formula Student Team - "Road Arrow"

The Tenfore Road Arrow team represents the University of Belgrade and Serbia in the most prestigious student's competition in the world - Formula Student. It is Europe's most established educational motorsport competition, organized by SAE and IMechE. Backed by industry and high profile engineers, the competition aims to inspire and develop enterprising and innovative young engineers. Universities from across the globe are tasked to design and build

a single-seat racing car in order to compete in static and dynamic events, which demonstrates their understanding and evaluates the performance of the vehicle.

Being involved in the Formula Student project means that you are ready for:

- Extremely demanding engineering project that will boost your creativity,
- New challenges in cooperative work environment,
- Getting into the world of motorsport industry where you will meet some of the best engineers in the world,
- Real projects with tight schedules and almost always very limited funds,
- Most challenging European competition for undergraduates who want hands-on experience in an innovative racing team.

Since 2010, the Tenfore Road Arrow team has been involved in 17 competitions all over Europe. First entry in Top 10 teams was in 2013 at the famous Riccardo Paletti circuit in Italy. Second best result since then was in 2015 when the team finished endurance race in fourth place and 9th overall at Autodrom Most in Czech Republic. In 2016, third place was won for the concept of an electric car and a Top 10 for engineering design of internal combustion engine powered car. Finally in 2017, 5th overall in static disciplines in a competition of 50 University teams at the race track in Italy. During the 2018 season, a great success was achieved in dynamic part of the competition, scoring 6th place at the Skid Pad in Italy and 3rd place in endurance out of 30 teams in the Czech Republic.

In season 2018, improvements of performance and reliability were the main focus. The suspension system has been completely redesigned, allowing flexible adjustment and easier maintenance. Also, suspension, steering and braking systems have been updated with numerous sensors for better understanding of vehicle dynamics. Aerodynamic package elements were improved following trends in automotive industry regarding the implementation of composite structures. Regarding the powertrain, numerous on-track testing has been performed and a new exhaust muffler was designed to meet noise emission demands. Main innovation in terms of effective relation between the driver and the pit-line is based on communication devices completely developed by students. Also, applications for logging and analysis of track-recorded data are in continuous development.

After eight years of involvement in the Formula Student competitions and with great persistence, the team has established good relations with numerous institutes and companies in the country. From previous season, a general sponsorship has been signed with Tenfore payment company. The most important sponsors and support companies are 3D Republika, Kroma Ltd, Teknoxgroup CAT, Mercedes-Benz – Emil Frey, Alatnica Orelj, ZF Sachs and SKF among others that could be found on web site sst.org.rs.

Faculty of Mechanical Engineering Student Team - "Confluence Belgrade"

Confluence Belgrade is a student team under the Department of Naval Architecture, Faculty of Mechanical Engineering. In 2016, the Department received an invitation to participate in Hydrocontest - the major global student competition promoting the research in energy efficiency of ships. Students were challenged to design, build and pilot the most energy efficient ship. The team was founded and started preparing the models.

Beginning was very hard as ideas for the project were plenty, and the funds, however, were limited. With the significant help of their supervisor, professor Milan Kalajdžić, students managed to overcome financial and engineering obstacles. During 2017, the team built two remotely controlled, electrically driven boats. Boats are designed to compete in heavyweight (has to carry 200 kg of weight), lightweight (has to carry 20 kg of weight) and endurance race categories. The year of hard and dedicated work turned out to be fruitful. In the competition that took place in France (Saint-Tropez) in September of 2017, out of 22 teams from around the world, Confluence Belgrade vessels achieved outstanding results: second place in lightweight, third place in heavyweight category and forth place in the endurance race.

The team entered the next season even better prepared and with higher ambitions. In September 2018, Hydrocontest races took place

in the same city. The novel methods of shipbuilding and propeller testing effectiveness used during the project development have given tremendous results. As the competition increased (28 teams), Serbian students won the first place in the heavyweight category winning against some of the best Universities in the world! The student team proved that the previous year results were no matter of coincidence as the long standing tradition of Naval Architecture in Serbia carries on.

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 Ortodox 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.

Hours weekly	1st year		2nd year		3rd year	
	1st	2nd	3rd	4th	5th	6th
1	Mathematics 1	Mathematics 2	Mathematics 3	Thermodynamics B	Fluid mechanics B	Electrical engineering
2						
3						
4						
5						
6	Mechanics 1	Basics of strength of constructions	Mechanics 2	Mechanics 3	Numerical methods	Control engineering
7						
8						
9						
10						
11	Constructive geometry and graphics	Engineering graphics	Machine elements 1	Machine elements 2	Manufacturing technology	Elective course 6.3.5
12						
13	Strength of materials					
14						
15						
16	Physics and measurements	Engineering materials 1	Engineering materials 2	Elective course 4.4.5	Elective course 5.4.5	Elective course 6.4.5
17						
18		Basics of sociology and economics				
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. thesis) 6.5.5
22						
23	Programming	Computational tools				
24						
25						
				Elective Skill praxis B 4.8		

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.

Skill praxis B, M = Internship, training, practice

Hours weekly	1st year		2nd year	
	1st	2nd	3rd	4th
1	COURSE OF ELECTIVE SPECIALIZATION 1.1.5	COURSE OF ELECTIVE SPECIALIZATION 2.1.5	COURSE OF ELECTIVE SPECIALIZATION 3.1.5	Skill praxis M of elective specialization 4.1
2				
3				
4				Optional: Foreign language 4.2
5				
6	COURSE OF ELECTIVE SPECIALIZATION 1.2.5	COURSE OF ELECTIVE SPECIALIZATION 2.2.5	COURSE OF ELECTIVE SPECIALIZATION 3.2.5	Master (M.Sc.) thesis 4.3
7				
8				
9				
10				
11	Mechanics M or Fluid mechanics M 1.3.5	COURSE OF ELECTIVE SPECIALIZATION 2.3.5	COURSE OF ELECTIVE SPECIALIZATION 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				

European Accreditation of Engineering Programmes EUR-ACE®

ASIIN Accredited Degree Programme 2018-2025

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** 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 study specialization from a certain department he/she has taken and completed. Abbreviations: M.Sc.ME or MSc ME.

Courses of elective study specialization are given in the section on **Study Specializations (Study Modules)**.

ECTS	1st year		2nd year		3rd year	
	1st	2nd	3rd	4th	5th	6th
5	Advanced course of mathematics 1.1.5	Advanced course of mechanics or fluid mechanics 2.1.5	Elective course 3.1.5	Research & publication - IV 4.1.8	Ph.D. thesis text preparation 5.1.10	Ph.D. thesis text preparation 6.1.10
5	Numerical methods 1.2.5	Elective course 2.2.5	Elective course 3.2.5			
5	OMSR and communication 1.3.5	Elective course 2.3.5	Research & publication - III 3.3.20	The project of Ph.D. thesis proposal 4.2.22	Research & publication of papers for Ph.D. thesis 5.2.20	Ph.D. thesis public defense preparation 6.2.20
5	Elective course 1.4.5	Research & publication - II 2.4.15				
10	Research & publication - I 1.5.10					

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).

Accreditation

Approval and Recognition of UB-FME Quality

Accreditation system of institutions and study programs in Serbia has been introduced for the first time in 2005 by the new Law on Higher Education, which also introduced Bologna process. National Commission for Accreditation and Quality Assurance (CAQA, КАПК in Serbian, http://www.kapk.org/) has been appointed as the responsible independent institution for executing the process. For accreditation of the university faculties, the process effectively started in 2007 and UB-FME was the first one to apply and get accreditation from CAQA. Certificates for the institution (faculty) and all study programs (BSc, MSc, PhD, all in Serbian) were issued on May 19, 2008.

At that time CAQA was not the member of ENQA (European Association for Quality Assurance in Higher Education, http://www.enqa.eu/) and its certificates were not fully recognized internationally. This was one of the reasons why the UB-FME applied for the TEMPUS project on International Accreditation of Engineering Studies, got it granted and successfully finished it by getting its BSc and MSc programs in English accredited with ASIIN (Akkreditierungsagentur für Studiengänge der Ingenieurwissenschaften, der Informatik, der Naturwissenschaften und der Mathematik e.V., Germany, http://www.asiin.de/), and also gaining EUR-ACE (European Accredited Engineering Programme, http://www.enaee.eu/eur-ace-system) label. Participation and help of foreign partner institutions in TEMPUS project (TU München, KIT - Karlsruhe Institute of Technology, ICL - Imperial College London, UPC - Polytechnical University Catalonia Barcelona, GUC - German University in Cairo) is gratefully acknowledged.

In the meantime, the study program in Naval Architecture also got international verification by being accredited by RINA (The Royal Institution of Naval Architects, http://www.rina.org.uk/).

In the second and third rounds of National accreditation, UB-FME was also the first institution to apply and got renewed accreditation for all study programs (BSc, MSc, PhD) but now both in Serbian and English, got reaccreditation by RINA and is now in the proccess of reaccreditation by ASIIN.

European Commission
TEMPUS

INTERNATIONAL ACCREDITATION OF ENGINEERING STUDIES

144856-TEMPUS-2008-RS-JPGR (15.1.2009–14.1.2013)
This project has been funded with support from the European Commission.

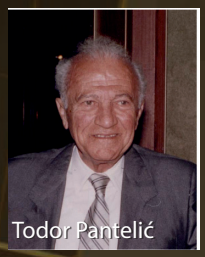
European Accreditation of Engineering Programmes
EUR-ACE®

Study Specializations
(Study Modules)

ASIIN
Accredited Degree Programme
2018-2025

University of Belgrade
Faculty of Mechanical Engineering

Cum Laude Students Awards


Todor Pantelić

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).


Dušan Tomić

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.

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.

Throughout its illustrious history, the programme has continued to be an important training ground for future engineers across the country, region and even the world. It continues to be popular with students for its novelty, creativity and permanent progress. Furthermore, the department is constantly making an eff ort to remain on par with other similar departments worldwide.

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 needs. The department offers coursework that fully prepares students to become members of advanced design teams prepared for the challenges of modern aerospace engineering worldwide.

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.

The goals of this programme are:

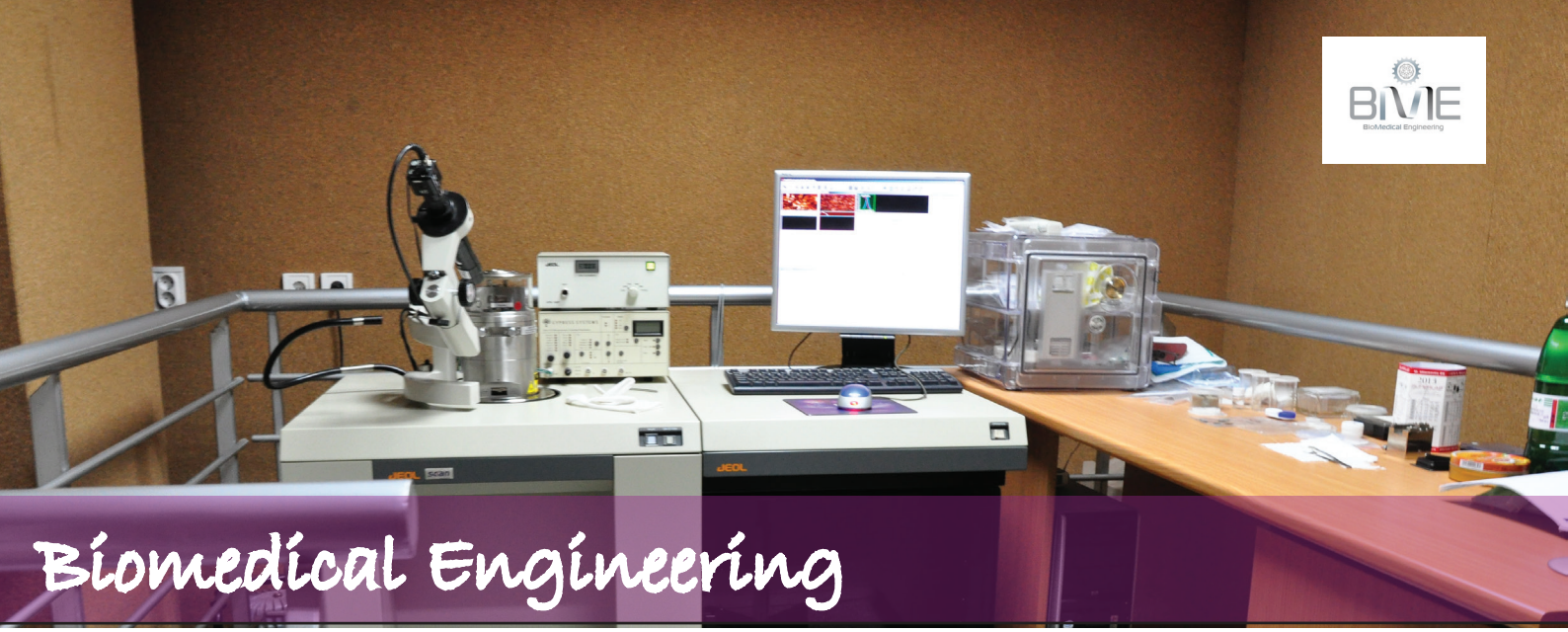
- to provide a comprehensive aeronautical engineering education that develops in students fundamental skills necessary for the design, analysis, synthesis and research of the aircraft, spacecraft and other high technology flight systems, and
- to prepare students for various professions in aeronautical engineering and related fields by developing in them attributes needed to make significant contribution to the society and to the engineering community both now and in the future.

The educational objectives of the Aerospace Engineering programme are to produce graduates (after three or five years of studying) whose expected accomplishments will be either successful careers in industry, private practice, government or research institutes or continuation to advanced postgraduate studies. After the faculty, the students will be skilled practitioners able to apply their knowledge and expertise when solving relevant engineering problems both in the aeronautical or 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!"

Miloš Petrašinović
Graduate student in Aerospace Engineering



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?"

Valentina Matović
PhD student at
Biomedical engineernig

Biomedical Engineering

The Biomedical Engineering (BME) is one of the latest study specializations at the Faculty of Mechanical Engineering, which provides to students a multidisciplinary education and qualifies them for a variety of biomedical engineering jobs worldwide.

The study programs of BME offer analytical tools to understand how biological systems operate and in which manner engineering principles should be applied to resolve medical and biological problems. During M.Sc. mandatory and optional courses, students have opportunities to achieve knowledge in different fields such as tissue mechanics, signal processing, biomedical devices, nanotechnology, and get practical experience in organization and functioning of the environment in which they will apply their knowledge in the future professional career. Through combination of theoretical and practical work students learn to use and maintain modern equipment and perform applied research in biomedical engineering. There is an intensive collaboration between teaching staff of Biomedical Engineering study specialization and medical doctors, biologists, chemists and engineers working in medical facilities and companies, that allow our students to conduct studies, improve existing and develop novel devices, materials and diagnostic methods through their Master thesis. Our approaches in biomedical engineering include invention of new methods, device improvement, equipment maintaining and applying information technologies in clinics.

Biomedical Engineering - a truly MULTIDISCIPLINARY challenge

Our main research areas are:

1. Early skin cancer and Melanoma detection
2. Nanomedical engineering
3. Biomedical software engineering
4. Clinical engineering

BME study specialization has two laboratories equipped with modern instruments and they are available for students of M.Sc. and Ph.D. studies. The first laboratory, Nanolab, provides opportunities for research in the area of Nanotechnology and Nanoscience while the second one gives students possibilities to design and develop their own medical devices and aids.

OBLIGATORY COURSES for MSc

- Spectroscopy methods and techniques
- Biomedical instrumentation and equipment
- Biomaterials in medicine and dentistry
- Biomechanics of tissue and organs
- Introduction to nanotechnology
- Signal processing
- Nanotechnology
- Clinical engineering
- Nanomedical engineering
- Skill Praxis M-BMI

Projects:

1. Project III 41006 - Development of new methods and techniques for early diagnosis of cancer; financed by Ministry of Science and Technology of Republic of Serbia
2. Project III 45009 - Functionalization of nanomaterials for a new type of contact lenses and early diagnosis of diabetes, financed by Ministry of Science and Technology of Republic of Serbia
3. TEMPUS: Studies in Bioengineering and Medical Informatics (BioEMIS)

Collaboration with:

- Kobe University, Japan
- Tokyo Institute of Technology, Japan
- Massachusetts Institute of Technology, Boston, USA
- University of Washington, Seattle, USA
- Faculty of Medicine, Belgrade University, Serbia
- Faculty of Dental Medicine, University of Belgrade, Serbia
- Military Medical Academy, Belgrade, Serbia

Control Engineering

Study specialization 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 calculation, 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.

OBLIGATORY COURSES for MSc

- Computer control
- Automatic control
- Fuzzy control systems
- Nonlinear systems 1
- Object and process dynamics
- Nonlinear systems 2
- Design and control system technology
- Linear system design
- Skill praxis M - CAY
- MSc thesis

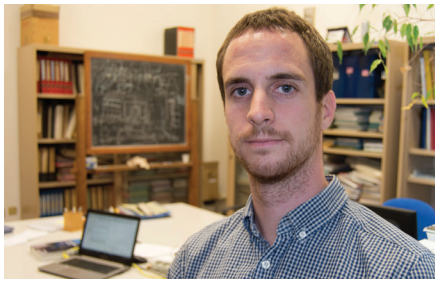
"As in every new chapter in life, I have a lot of expectations and fears. I expect a lot of challenges and new knowlege in the field of automatic control."

Ksenija Joksimović
Graduate student in Control 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, as well as team work on comprehensive projects that should be presented and defended to course staff."



Stefan Rudaković, *teaching and research assistant at the Department of Naval Architecture did a part of his PhD research at University of Trieste in Italy.*

Naval Architecture

The main goal of study specialization 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, seakeeping, 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.).

ALSO ACCREDITED BY

THE ROYAL INSTITUTION OF NAVAL ARCHITECTS

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 – БРО
- Ship manoeuvring
- International maritime regulations
- Ship strength 2
- Software application in ship design
- Ship design
- Seakeeping
- Marine Engines
- Ship turbines and boilers
- MSc thesis

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

Following the new world trends in the field of welding, necessary for fulfilling the requirements for trained specialists, starting from the academic year 2005/6, the Department for Engineering Materials and Welding, Tribology, Fuels and Combustion along with the Department for General Machine Design, and with the support from "Messer Tehnogas", a.d. Belgrade, have jointly created the new elective study specialization (profile) of academic studies within the master of science degree, called – Welding and Welded Structures (WWS).

OBLIGATORY COURSES for MSc:

- Engineering Materials 3
- Fuel, lubricants and industrial water 2
- Design of Welded Structures
- Welding Metallurgy
- Design and Construction M
- Operational Strenght
- Welding Technology
- Reliability of Structures
- Fracture Mechanics and Structural Integrity
- Skill Praxis M - 33K
- MSc thesis

The WWS study specialization is designed to cover four major fields in the science of welding, compiled both in obligatory (compulsory) and selective courses of the M.Sc. academic studies:

1. Welding processes and equipment, including both conventional and unconventional processes, as well as related processes.
2. Materials and their behaviour during welding, focused on the weldability of all important structural materials.
3. Design of welded structures, including strength and strain analysis and the structural integrity of welded joints; their reliability, remaining life assesment and quality assurance and quality control.
4. Fabrication, application and welded joint engineering, with a special accent on non-destructive testing methods and in-service behaviour. Failure analysis and repair welding procedure specifications with practical examples complete this topic dealing with the behaviour of welded joints at conditions of creep, fatigue, friction, wear, and corrosion.

"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, power, energy, manufacturing, petrochemical, chemical, process, automotive and even consulting."

Miloš Bašović
Graduate 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 study specialization are applicable in development of all mechanical systems."

Marija Paunov
Graduate (MSc) student in Design in Mechanical Engineering

Design in Mechanical Engineering

Elective study specialization, Design in Mechanical Engineering, trains mechanical engineers of general orientation with skills of innovative development of new technical (mechanical) systems for the new functions (Function-based Design), innovative increase the level of technical systems for existing functions (Property-based Design) and innovative linking of electronic-software and mental control (Behaviour-based Design). In these innovative design, the students are trained to recognise the five levels of technical innovation (rationalization, modernization, new variant solution, new principle and invention), the students are courage to develop those highest levels that imply new principles and inventions. Mechanical engineer with listed skills has the main role in every expert team for product development in all branches of engineering.

The students are prepared to develop TS function and user needs, harmonized to human features, environmental and ecological needs. TS 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), etc. Laboratory for Design in Mechanical Engineering is also available to students training.

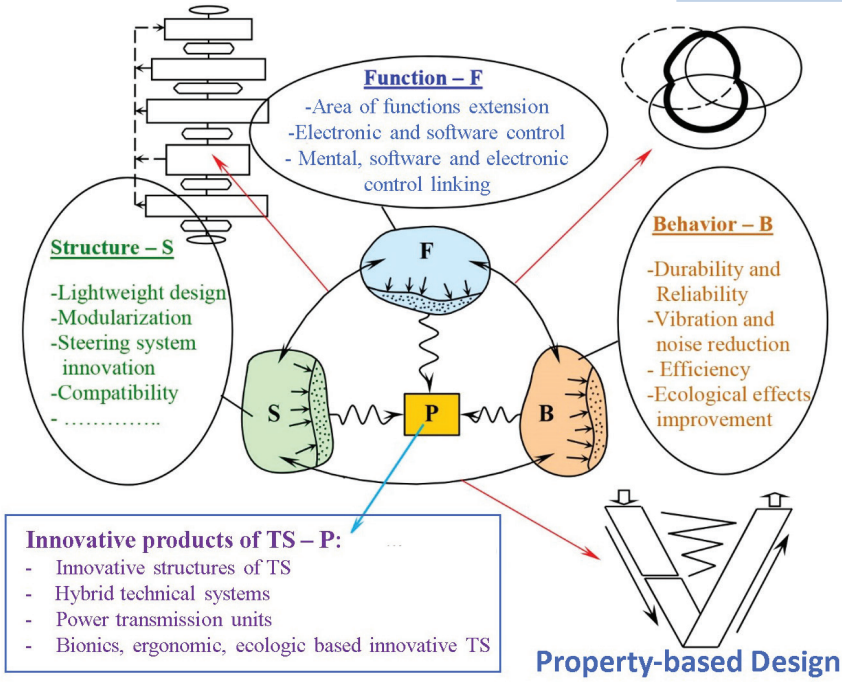
OBLIGATORY COURSES for MSc

- 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 - ДУМ
- MSc thesis

Curriculum of the study specialization contains the three groups of courses. The first one is the courses which is related to the creation of ideas, the development of the principle solutions, the development of the structure of the system, the development of desired properties, and the like. In this sense, the most important are the Innovative Design of Technical Systems, Methods in Engineering Design, Methods of Optimization and Decision Making Methods, Modelling and structure calculation. The second group continues the courses which provide skills in the design tools applications (Software tools in design) and necessary knowledge about bionics, ergonomics, ecology etc. The thread group continues elective courses which spread area of knowledge and practical application of specific TS development such as Hybrid technical systems or Gear power transmission units.

VISITING PROFESSOR

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



Design in Mechanical Engineering

Information Technologies

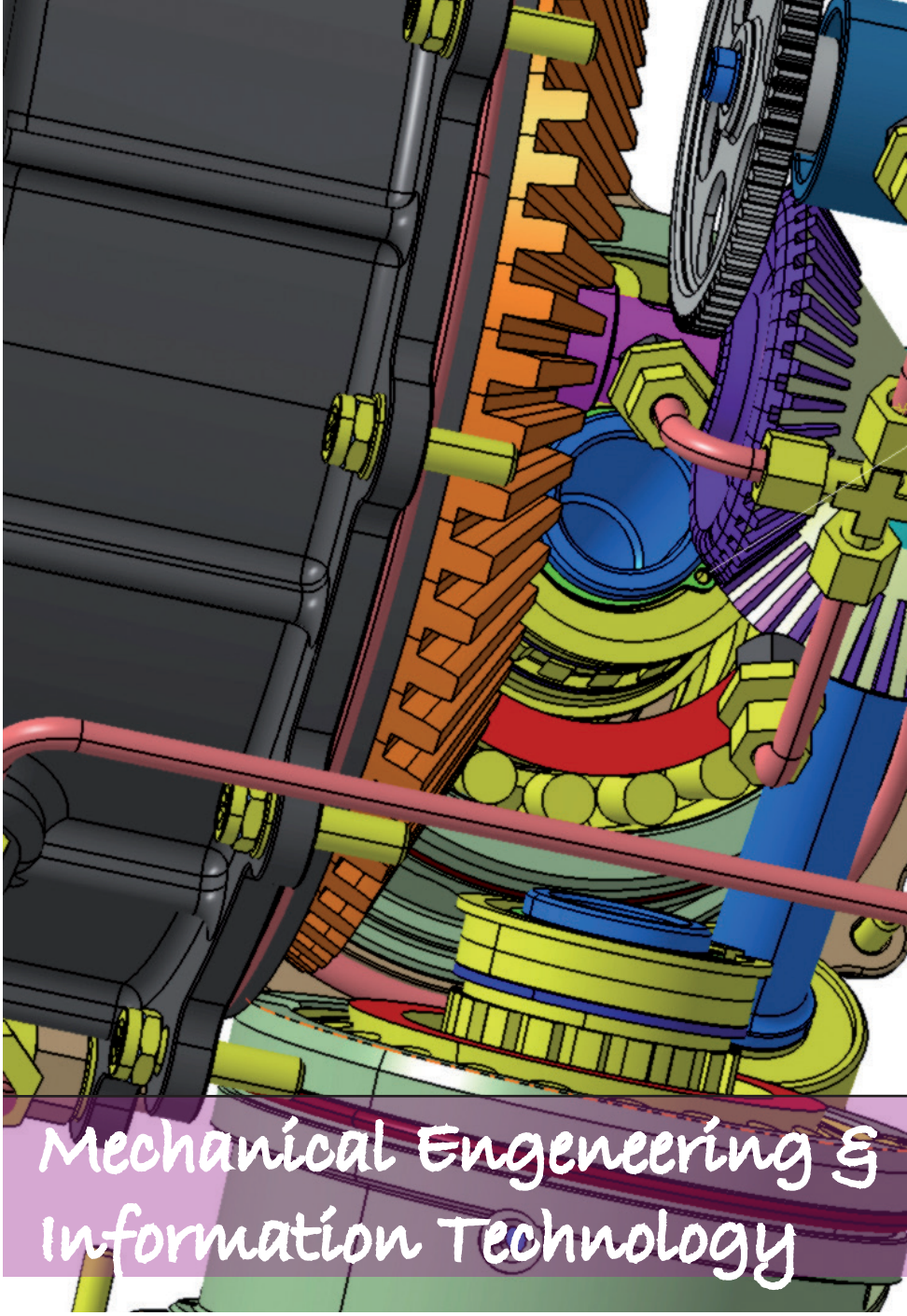
Rapid dissemination of digital technologies has been accompanied by the development of high-performance intelligent machines, such as next generation mobile devices, hybryd cars and robots. These products and services are made possible by the integration of various technologies through digital technology.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

OBLIGATORY COURSES for MSc.

- C/C++
- Algorithms and Data Structures
- Object-Oriented Paradigm
- The Data Exquisite in Mechanical Engineering
- Introduction to Engineering Simulation
- Distributed Systems in Mechanical Engineering
- Computer Networks
- Information Integration of Business Functions 2
- Digital Systems Design
- Method of Optimization
- Programmable Control Systems
- Evaluation of the Project in the Field of Information Technology
- Statistical Analysis in Mechanical Engeneering
- Designing Software for Mechanical Engeneering
- Skill Praxis M - МИТ
- Msc Thesis

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 study specialization 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.



Mechanical Engeneering & Information Technology

"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

"Life in the big cities is unimaginable without efficient public transportation. Rail systems make backbone of the well organized public transportation system. Imagine an automatic driverless metro system in Belgrade. We would like to participate in realization of one such great idea."

Milena Šoškić and Slavko Stanković
Graduate students
in Railway Mechanical Engineering

Railway Mechanical Engineering

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

The power needed for train movement and resistance overcoming make difference in types of locomotives which are 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 low 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 the 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.

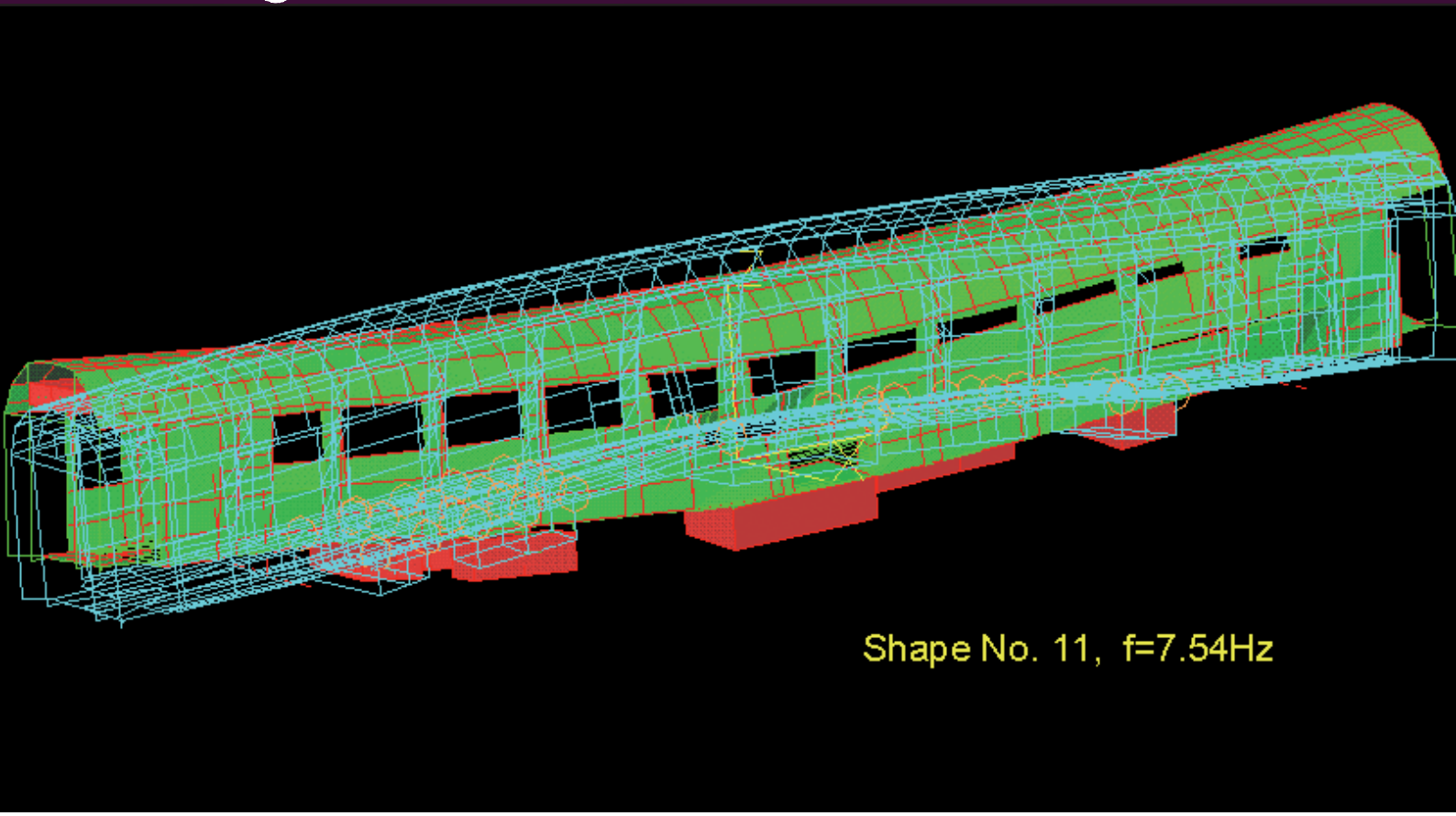
Something forgotten? Of course, we need to know how to maintain and repair these vehicles and ...

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

Railway Mechanical Engineering



Internal Combustion Engines

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.

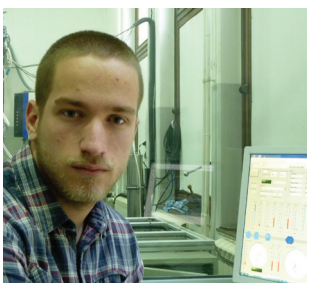
Study of Internal Combustion Engines is hardly imaginable without extensive laboratory practice. For this reason, we at ICED, apply special attention to practical training in instrumentation and measurement techniques in general, highlighting very interesting topics in special techniques of stationary 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

"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."



Aleksandar Aleksić
MSc 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 lives by using new techniques in agricultural engineering."

Nevena Tasić
MSc student of Engineering Biotechnical Systems

Engineering of Biotechnical Systems

Agricultural Engineering task is to apply technological tools to increase the agricultural production and effiency, improve product quality of the improvement. These problems will be 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, biotehnology and food processing.

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

Engineering of Biotechnical Systems study specialization educates highly qualified engineers capable of designing, constructing, researching mainteneance of agriculture machines, facilities and equipment. That is conducted throught bachelor, master and PhD studies.

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

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

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

OBLIGATORY COURSES for BSc

- Renewable and secondary resources
- Agricultural Machines and Equipment
- Machines and Equipment for Food processing and Production
- Biosystem Engineering
- Drying and Hygrothermal processes
- Skill Praxis B - IBS

OBLIGATORY COURSES for MSc

- Technological processes in agro complex
- Tractors and self-propelled agricultural machines
- Fundamental transport phenomena and drying techniques
- Designing agricultural machines and equipment
- Special techniques and technology of drying
- Processing technology of agricultural products
- Geoinformation and remote control of biotechnic systems
- Managing food safety and quality
- Plant and process design and energy systems
- Plant design for food production and processing
- Skill Praxis M - IBS

Motor Vehicles

The Motor Vehicle Department prepares students for a wide range of careers in a fast growing, 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 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.

OBLIGATORY COURSES for MSc

- Vehicle Design
- System Effectiveness
- Vehicle Propulsion Systems
- Automotive Frictional Systems
- Vehicle Mechatronics
- Skill Praxis M
- Vehicle Structures
- Vehicle Testing
- Vehicle Maintenance
- MSc Thesis

As an automotive industry deals with the complex products, processes and constraints, engineer's approach to motor vehicle 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 subsystems. Working in the modern automotive industry cannot afford to ignore system approach in the process of vehicle and/or its components development. Accordingly, the motor vehicle 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 courses at Motor Vehicle Department are selected and designed to reflect:

- a top-down approach to the vehicle engineering topics,
- a "system 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

"Automotive engineering is really interesting to me because I get the opportunity to learn about vehicle design process, manufacturing and testing. Also, being involved in design of a small race car for Formula Student competitions makes it more interesting and challenging."

Branko Miličić
Graduate student in Motor Vehicles

Industrial Engineering

"The IE programme is an incredibly rewarding experience for me. It nicely integrates empirical work with excellent cooperation with professors and assistants and has a focus to develop students' ability to manage different projects. The broad structure of the programme appeals to me very much since it covers a diverse range of subjects and knowledge that cater to today's job market. After Case Study competition I have immediately got a very good job."

Danijela Živanović,
Graduate (MSc) student in Industrial Engineering

Industrial Engineering

While most engineering disciplines apply knowledge and skills in individual areas, Industrial Engineering is applicable in every industry.
The department of Industrial Engineering is firmly convinced that the future is tailored to the young! Therefore, we carefully listen to the needs of students and the labor market and improve processes every day, because our students have something to say.

Our department was established in 1990 as the first one in the Balkan region to meet the growing demand on qualified industrial engineers. 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, job design and methods improvement, design of material handling systems, project appraisal, ergonomics, applied computer science in industrial engineering, quality and risk management and operations research. The department cooperates with various national and international institutions and is engaged in basic and applied research projects, with a strong connection to the industrial world.
Our programs are designed with the aim of educating engineers with the knowledge and skills necessary to function in working environments where cost effectiveness, high productivity, continuous quality and reliability improvements, waste reduction and efficient resource utilization are critical success factors for organizations. 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, so it is quite common for our students ending up having job offers during their internships. 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
- Engineering Statistics
- Industrial Logistics
- Ergonomic Design
- Design of Organizations
- Operations Research
- Fundamentals of Database Systems
- Industrial Management
- Skill Praxis M – IIE
- MSc thesis

The Industrial Engineering Department is known for the:
- Experienced, dynamic and research-oriented faculty members
- Modern classroom, equipment and laboratory facilities
- Courses that are designed to meet the needs of the future trends
- Opportunity to participate in the academic and social activities organized within the department
- Undergraduate diploma and Graduate programs leading to MS and PhD degrees in Industrial Engineering

The value of our graduates is very well understood in every field of the manufacturing and service industries. Our graduates easily find jobs in both global and local corporations all over the world. Our graduates have proven that they can add value to companies in almost every field due to their strong knowledge in engineering, application skills, and ability of working in multi-disciplinary and multi-cultural teams. We are proud on our students that have leading positions in Bombardier, Bosch-Siemens, Philips, SAP, ISO - International Organization for Standardization, Danube Commission and many other companies!

Food Industry Engineering

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 specialization 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 M – ПРМ
- Packaging machines
- Food processing machines
- Design of plants and process and energy systems (with ИБС)
- MSc thesis

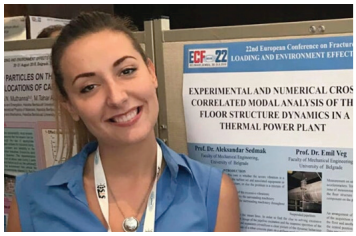
Although there was no study specialization in the past, a large number of students graduated at the Department working on research projects, since the Department is fully capable of giving significant contribution to development of new technologies and products in cooperation with industry. Our professors 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 study specialization was fully justified.

Study programes 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.

"The department has many excellent teachers, who collectively have huge teaching and research experience. Professors are always ready to cooperate with students and they provide help in mastering the material. On this department students learn through practice and real projects, which is very important for every student"



Aleksandra Joksimović
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 – ПРО
- New technologies
- Quality management
- Intelligent manufacturing systems
- MSc thesis

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.

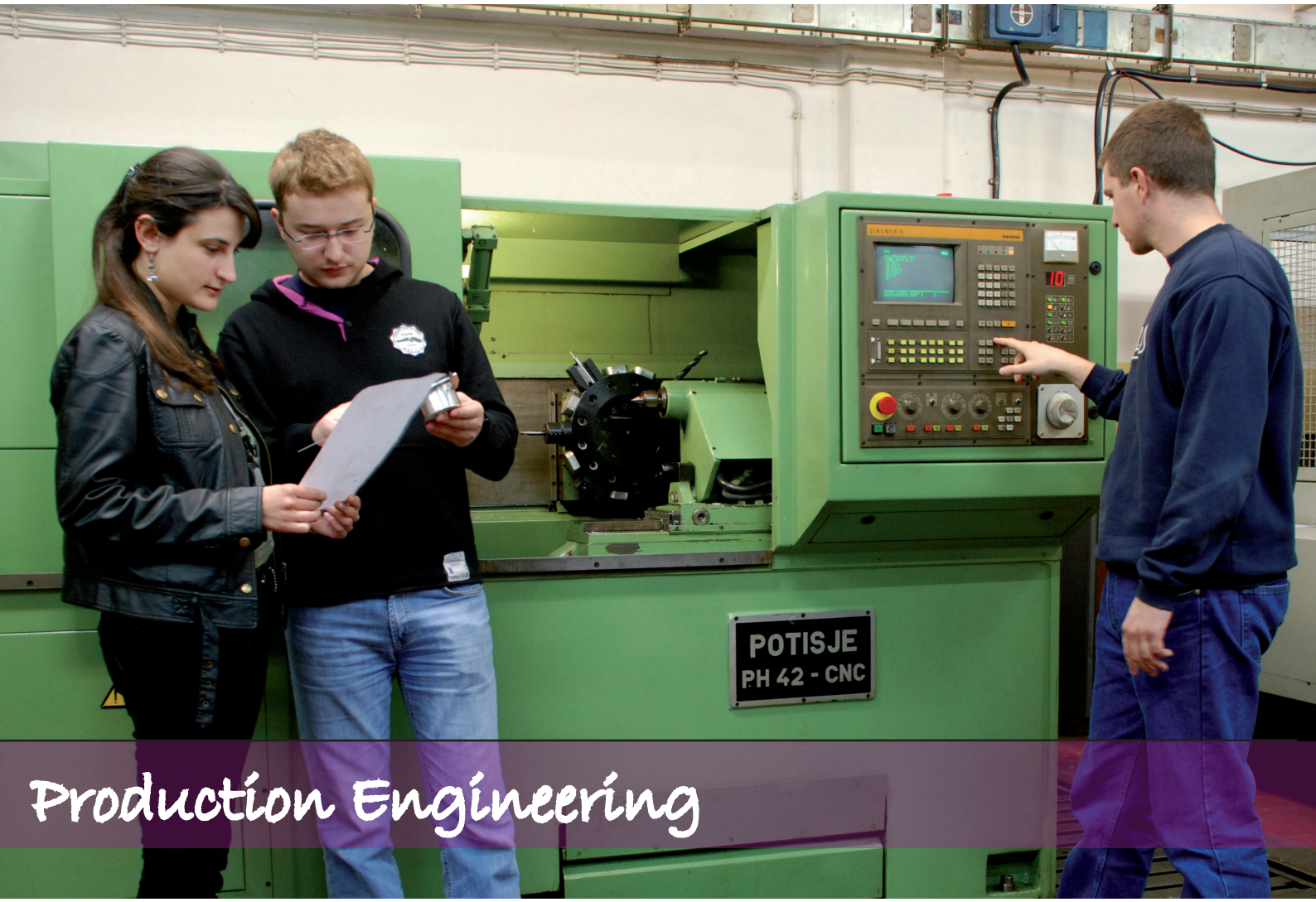
Programs of study are well rounded and balanced units, embracing methods of study and knowledge tests, study results and student competencies.

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



Production Engineering

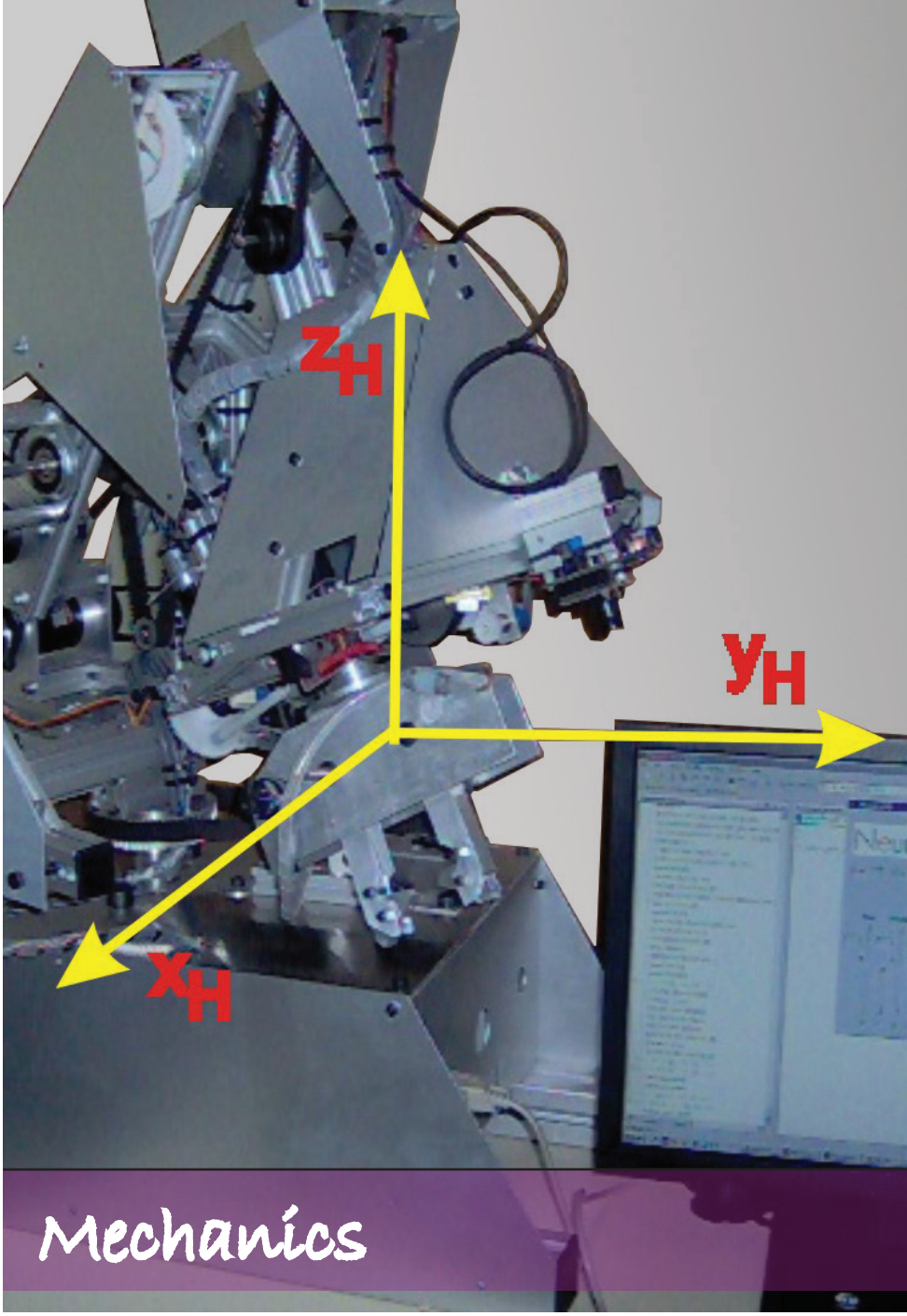
Mechanics

Study specialization for Mechanics is multidisciplinary specialization which provides theoretical and practical knowledge in following fields:

OBLIGATORY COURSES for MSc
- Analytical mechanics
- Continuum mechanics
- Theory of elasticity
- Theory of finite elements
- Mechatronic robotics
- Multiphase flows M
- Fluid mechanics 1
- Applied numerical fluid mechanics
- Skill praxis M - MEX

1. Rigid body mechanics
2. Solid body mechanics
3. Fluid mechanics

After a successful completion of courses, students will be able to apply acquired knowledge for
- design, production and maintenance of rigid mechanical systems like ideal mechanisms, robotic systems, mechanical control systems, mechatronics systems
- design, production and maintenance of deformable mechanical systems and structural analysis of deformable structures; finite element and vibration analysis of structures
- design, production and maintenance of equipments which involve flow processes: pipelines, flow machines, tube transport of fluids and solid materials, multiphase flow; analysis by using computational fluid dynamics (CFD)



"Mechanics is one of the oldest sciences and as such represents basis of mechanical engineering and other technical sciences. Doing a PhD in mechanics therefore means studying foundation of mechanical engineering and contribution in progress of the science"

Veljko Petrović
MSc student in Mechanics

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

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 – ПТХ
- Design, construction and exploitation of process plants
- Mass transfer operations and equipment
- Air pollution control
- Waste and wastewater management
- MSc thesis

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 study specialization 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.

OBLIGATORY COURSES for BSc

- Introduction to weapon systems
- Fundamentals of weapon system design
- Fundamentals of projectile propulsion
- Projectiles flight mechanics
- Classical armament design
- Missile weapon design
- B.Sc. thesis

OBLIGATORY COURSES for MSc

- Physics of explosive processes
- Flight dynamics with aerodynamics of projectiles
- Rocket propulsion
- Fire control systems
- Interior ballistics
- Automatic weapons
- Projectile design
- Launching theory
- Artillery weapon design
- Guidance and control of projectiles
- Design of missiles and launchers
- Terminal ballistics
- Optical devices and optoelectronics
- Skill praxis M – SIN
- M.Sc. thesis (Diploma work)

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, 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 study specialization 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 to the students multidisciplinary knowledge in the field of weapon design, enabling choices within the variety of teaching subjects, allowing studies in smaller groups, offering good employment opportunities and other benefits.

"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."

Pajić Slobodan
Graduate student in 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

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 thermal 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

Material handling, the primary field of study at the Department, is present in every field of industry. Proper handling and transportation of the material is one of the key aspects of an efficient industrial system. As such, the curriculum has been designed to familiarise the students with the engineering challenges in these fields by allowing them to explore the methods of calculation and design of civil, mining and material handling machines and industrial and warehouse systems.

OBLIGATORY COURSES for BSc.

- Fundamentals of Steel Structures
- Elements of Construction and Mining Machines
- Material Handling Equipment
- Skill praxis B - TKL

Throughout the undergraduate (BSc.) and graduate (MSc.) academic study programmes, the students will gradually develop their proficiencies and tools for dealing with the challenges of designing an efficient civil, mining or material handling and transportation system. These include various calculation methods and theories as well as use of modern CAD software for creating 3D models, technical documentation or Finite Element Analyses (FEA).

By the time the study course is finished, the students will have some practical and theoretical background in the calculation and design of various types of civil and mining machines and systems: earthmoving machines, various kinds of cranes and excavators, conveyors, factories and warehouses, lifts and elevators, cable cars, and others.

OBLIGATORY COURSES for MSc

- Computer Aided Design in Material Handling Practice
- Construction, Mining and Conveying Machinery Elements
- Conveying and Material Handling Machines
- Cranes Design
- Design of Construction and Mining Machines' Subsystems
- Skill praxis M - TKL
- Eco Design
- Facility Layout and Industrial Logistics
- Fundamentals of Mining and Construction Machines Dynamics
- Mining and Construction Machines
- Structural and Stress Analysis
- Transport and Logistic Systems Design

The study programme is completed with a MSc. thesis, in which the student applies the acquired skills and knowledge to solve a real-world challenge in one of the fields covered by the study programme.

"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."

Aleksandra Arsić
PhD student at
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 specialization."

Bojana Bodiroga
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 specialization in Hydropower Engineering.

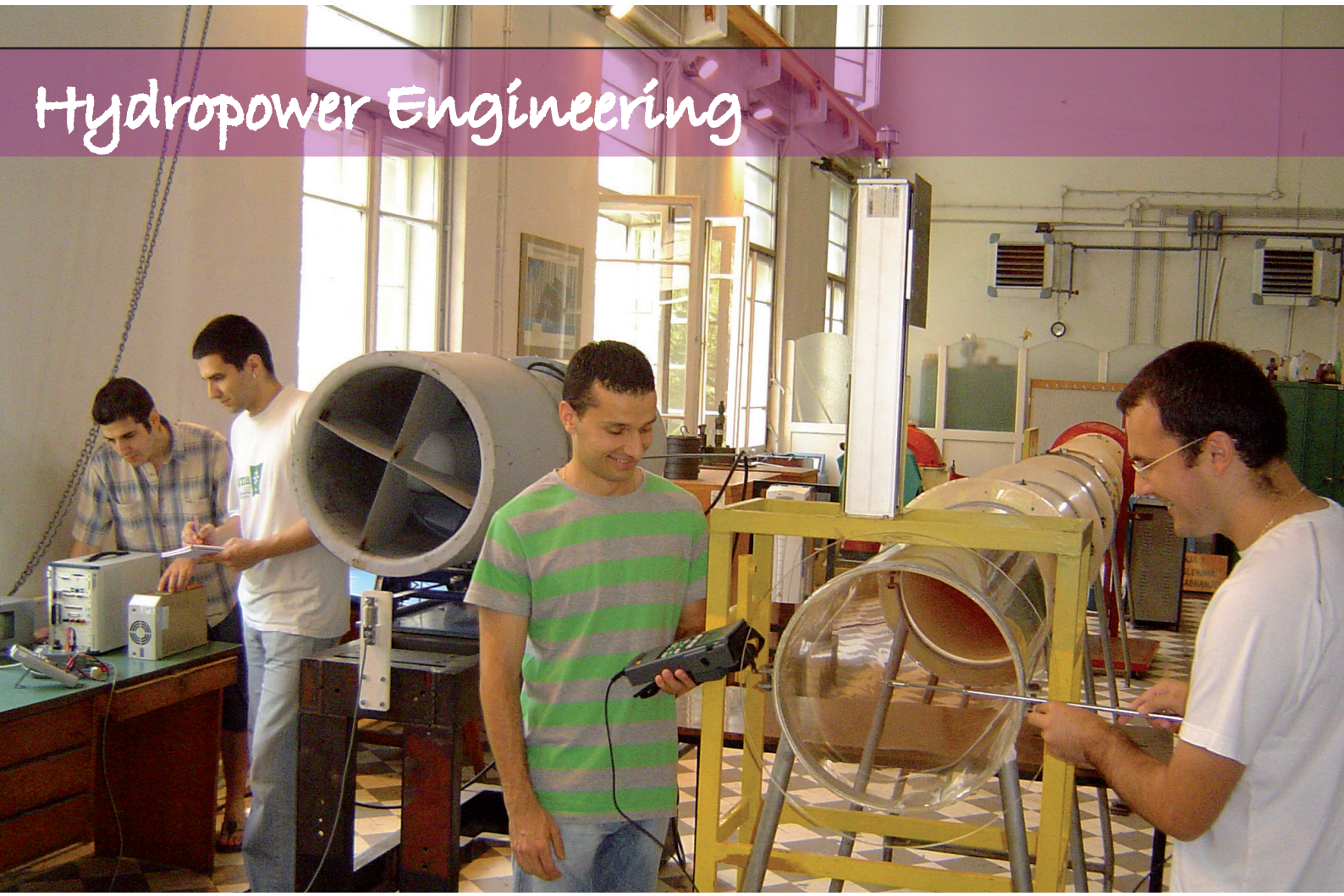
In addition to the thorough learning of the matter, students acquire knowledge from other mechanical engineering disciplines, so that they can involve in other domains of mechanical engineering, if necessary.

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

The study specialization 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 proffessional 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.



Thermal Science Engineering

Thermal Science Engineering

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

Master thesis (Diploma work) have to be taken from the list of courses passed by the students during the studies. Through the printed report and final exam in front of commission, the student proves his/hers capability to solve 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

In last couple decades, our study programme is the most popular among mechanical engineering students, since the number of enrolled students and graduates attend our courses. The reason is very simple – ease in finding jobs.

OBLIGATORY COURSES for MSc

- Steam boilers elements and equipment
- Refrigeration equipment (with ПРМ)
- 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

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."

Filip Karadžić
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.-ing Hans-Joachim Bungartz, TU München, Fakultät für Infromatik

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.

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.

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

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

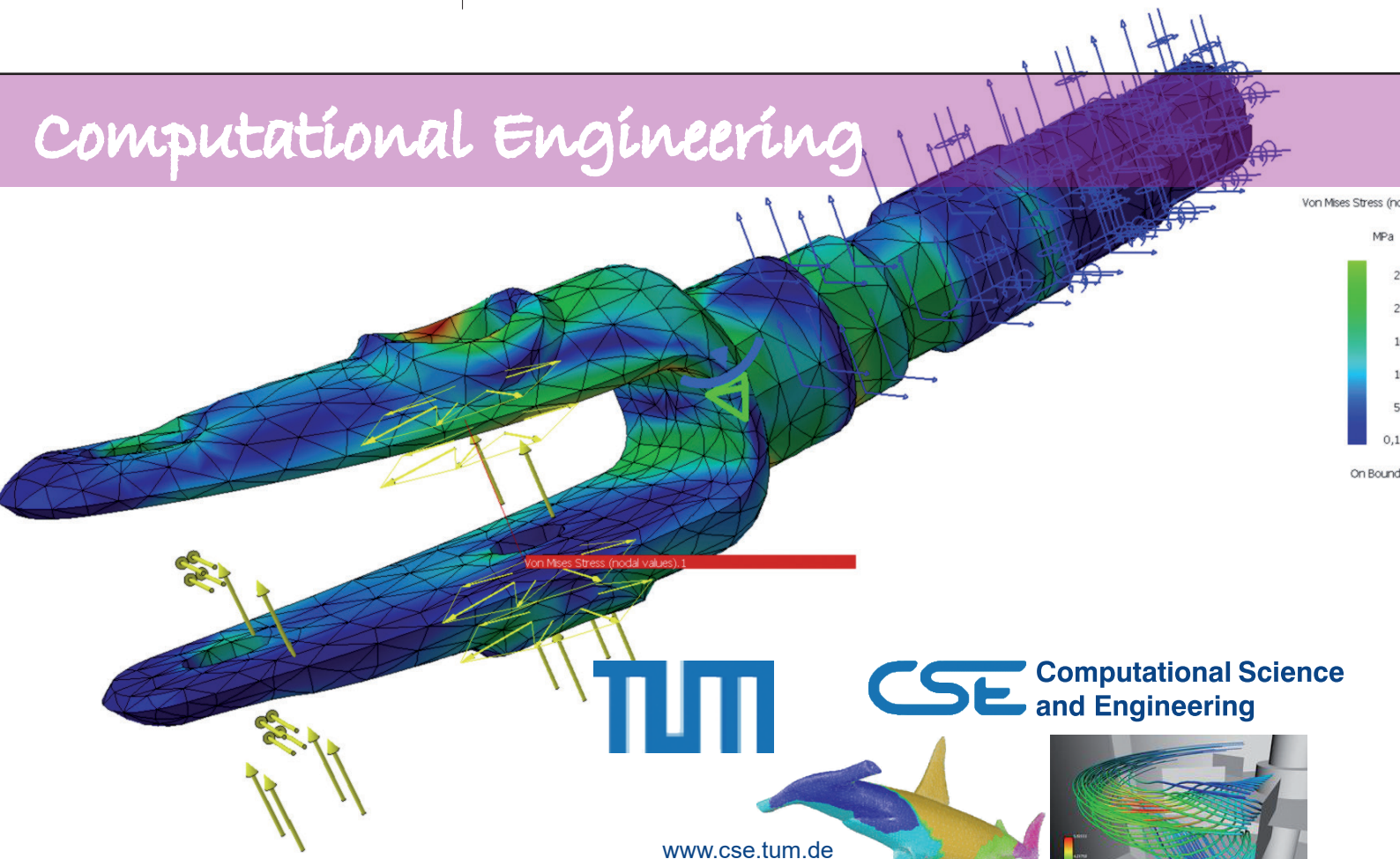
All mandatory courses of the program are held in English. Courses are provided by remote partner institute (TUM). These courses are realized as block courses in Belgrade.

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.

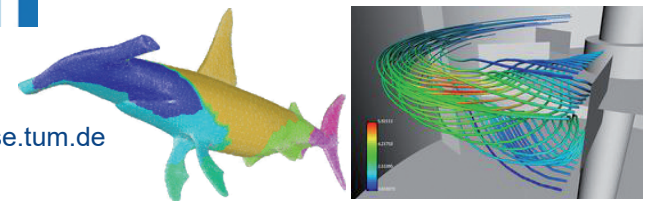
This study specialization does not run each year. Minumum of 15 students is needed, and the students who are interested to apply are advised to contact Prof.Dr. Zlatko Petrovic (zpetrovic@mas.bg.ac.rs) by mid-February, in order to see will there be a possibility to be enrolled for this study specialization.

Computational Engineering



Computational Science and Engineering

www.cse.tum.de



Departments

University of Belgrade
Faculty of Mechanical Engineering

Production Engineering

Production Engineering Department since its inception in 1948 has been trying to impart quality education to students and train them to meet the demands of the manufacturing industry. The department has established links with the industry, R&D organizations, and academic institutes worldwide. The department sees itself as a pathfinder of emerging technologies and techniques in the area of production engineering and develops students to be technologically and managerially sound to meet the challenges of the open market in the present era of globalization.

Production Engineering Department is committed to fostering sustainable development in production from manufacturing processes to manufacturing control and management.

The Department's educational mission is to provide a broad base for students preparing for technological and leadership careers within the manufacturing area.

The Department's research mission is to educate PhD students in fundamental issues concerning research as a profession as well as in core manufacturing areas with special focus on development of methods for modelling and simulation of manufacturing processes and systems; designing machine tools, robots, and tools; developing intelligent manufacturing systems; implementing quality management systems.

The teaching and research programs are conducted according to both disciplinary and inter-disciplinary aims.

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.

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

- Structural analysis (CAE),
- Manufacturing processes (Automation),
- Computer integrated manufacturing and technologies (CIM),
- CAD/CAM systems,
- Flexible manufacturing systems, working processes and tools (FMS),
- Industrial robotics and artificial intelligence (Robotics and AI),
- Production metrology and quality (CAQ),
- Cybernetics and mechatronic systems (CMSysLab)

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.
- EUREKA Project E! 3860- Automatic 3-D Design
- An Innovative Ecologically Based Approach to Implementation of Intelligent Manufacturing Systems for Production of Sheet Metal Parts
- Smart Robotics for Customized Manufacturing
- 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)

STAFF 14 professors, 3 teaching and research assistants, 2 associates
DATE FOUNDED 1948
DISTINGUISHED ALUMNI

- A.I. Kosicki, writer of first textbook in Serbian for Production Engineering
- Prof. Dr. Pavle Stanković, Famous lecturer
- Prof. Dr. Vladimir Šolaja, Long-term Head of the department
- Prof. Dr Vladimir Milačić, Long-term Head of the department
- Prof. Dr. Milisav Kalajdžić, Long-term Head of the department

COOPERATION WITH FOREIGN UNIVERSITIES

- Northwestern University, USA
- Technishe Universitat Berlin, Germany
- Aristoteles University Thessaloniki, Greece
- Tokyo University of Agriculture and Technology, Japan
- Kobe University, Japan
- National Academy of Sciences of Ukraine - Institute for Superhard Materials
- Zhitomir Institute of Engineering and Technology, Ukraine
- Universidade do Minho, Portugal

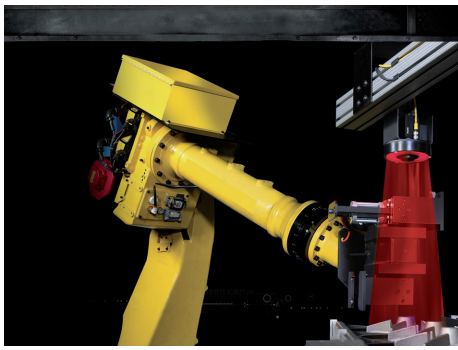
Tel: +381 (11) 3302 274
Fax: +381 (11) 3370 364
E-mail: bbabic@mas.bg.ac.rs
Web site: cent.mas.bg.ac.rs

Full Professors:
Dr. Ljubodrag Tanović, Dr. Bojan Babić, Dr. Petar Petrović, Dr. Zoran Miljković, Dr. Radovan Puzović

Associate Professors:
Dr. Božica Bojović, Dr. Saša Živanović, Dr. Živana Jakovljević.

Assistant Professors (Dozents):
Dr. Branko Kokotović, Dr. Nikola Slavković, Dr. Goran Mladenović, Dr. Mihajlo Popović, Dr. Slavenko Stojadinović, Dr. Milica Petrović.

Teaching and Research Assistants:
Miloš Pjević, Dušan Nedeljković, Nikola Vorkapić.



Material Handling, Constructions and Logistics

History and Tradition

The Department of Material Handling, Constructions and Logistics is one of the first departments established at the Faculty of Mechanical Engineering at University of Belgrade. Its history starts even further in the past (1897), with the course of Machines for Civil Engineering. Nowadays, the Department is committed to scientific research and applicative development in the areas of: structural analysis, mechanical and computer aided design, material flow, conveying machines, civil, mining and construction machines and industrial logistics.

STAFF 5 professors, 4 teaching and research assistants
DATE FOUNDED 1946
HEAD OF DEPARTMENT
- Prof. Srđan Bošnjak

COOPERATION WITH FOREIGN UNIVERSITIES
- Vienna University of Technology, Austria
- Graz University of Technology, Austria
- Montan University Leoben, Austria
- Wroclaw University of Science and Technology, Poland
- AGH University of Science and Technology, Cracow, Poland
- Leibniz University Hannover, Germany
- Karlsruhe University of Technology, Germany
- Dresden University of Technology, Germany
- TU Munich, Germany
- TU Dortmund, Germany
- University of Stuttgart, Germany
- TU Delft, Netherlands

AWARDS
12 for best technical innovations
2 for theses
1 for a PhD dissertation

Education

One of the fundamental activities of the Department is teaching, through which we try to help our students on their way to becoming successful engineers. Following the contemporary educational trends, we offer them modern working environment with theoretical assistance, along with strong computer aided backup. We consider them as partners in constant improvement of design and research processes in the field of material handling machines. We commit ourselves to turn our courses into a strong foundation for their future engineering practice. Our goal is to give every student the ability to, after completing the courses, work on the graduate thesis related to the practical industrial needs, and we make significant contribution to shape them into the 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 viewports 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 the similar academic Departments and Institutes from different countries.

Furthermore, our commitment is full cooperation with industry with more then 700 realized project

Epresentative Projects (Reference List)

- Superstructure stability of the Bucket Wheel Excavator SchRs 1600, Kolubara
- Design of the temporary support structure for gas oil tank, Port of Benghazi
- Stress state analysis of the roof construction during the lifting process, RTB Bor
- Reconstruction of the production line, BFC, LaFarge
- Erection of a bucket wheel excavator, ThyssenKrupp
- Design of a shipyard portal crane, Kostolac
- Design of a gantry crane for Shipyard Begej
- Rescue and Reconstruction of the Bucket Wheel Excavator SRs 1200, Kolubara
- Design of a bridge crane, Le Belier Kikinda

Our research facilities include:

- Laboratory for testing and certification of material handling machinesOur research facilities include:
- Computer laboratory used in lectures and student training
- Section for extracurricular student activities (CAD/CAE and FEA computer laboratory)
- Laboratory for the Design and Testing of Mining, Transport and Civil Machines
- Laboratory for Strength and Dynamics of the Load Carrying Structures of Civil and Mining Machines
- Laboratory for the Logistics, Eco Design and Terotechnology of Transport Machines.

Tel. +381 (11) 3370 831
Fax: +381 (11) 3370 831
E-mail: sbosnjak@mas.bg.ac.rs
Web site: www.mehanizacija.com

Full Professors
Dr. Srđan Bošnjak, Dr. Nenad Zrnić

Associate Professors
Dr. Nenad Kosanić, Dr. Vlada Gašić

Assistant professor
Dr. Nebojša Gnjatović

Teaching and Research Assistants
Goran Milojević, Miloš Đorđević, Ivan Milenović, Aleksandar Stefanović

Agricultural Engineering

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 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.

Education

Development in teaching for 60 years in the field of agricultural engineering is characterized by the introduction of new disciplines, the modernization aspects of teaching in laboratory using electronic measurement techniques and with the indispensable assistance of a computer. Department of Agricultural Engineering courses at specific areas of 17 subjects , 6 of the bachelor level and 11 at the master studies . Doctoral studies in specific areas of agricultural engineering listen to the four subjects. Intensive research work is based on developing new technological solutions in the field of biosystems engineering . Characteristic is the wide range of research , scientific and technical research related to the machines , devices and equipment of self-propelled agricultural machines, tractors and agricultural machinery for soil until the equipment for drying and storage of agricultural products and machinery and equipment for food processing.

Laboratories & Research

APS LAB (Agriculture Precision Solutions Laboratory) is a laboratory for precision engineering of biotechnical systems established in February 2014 at the Department, for educational and scientific research purposes. The basic field of teaching, scientific research and commercial activities within the laboratory and the equipment that the laboratory contains is satellite guidance of agricultural machines and engineering of site-specific management and precise agricultural production.

The commercial application of systems, devices and equipment for precision agriculture has been experiencing steady growth over the last two decades. APS LAB with its equipment and operation contributes to the introduction of potential users with new technologies, realizes savings economies projects for large agricultural corporations, develops more advanced technologies for more precise application of location-specific production and consulting affects all potential customers of advanced technology devices for navigation and management of agricultural machinery. APS LAB is ready to temporarily allocate part of the equipment to interested parties in order to combine commercial profits in real agricultural production and scientific research efforts to improve technologies and technical systems for application in precision agriculture. Cooperation of this type has so far been achieved with the biggest farm near Belgrade, PKB Belgrade.

Performances of department in domain of education and research in industry are: • high level student education (mentor work); • development of software, new tecnologies and solutions for pursing more operations in one pass; • development of service machines, units and equipments; • participations with projects in domestic and foreign congresses, magazines, published books, etc; • active cooperation with reputable international instuctions and attendances to foreigh 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.

Instruction is performed by contemporary research method, with a variety of laboratory practies, by using computer tecniques and ivolving students in reserch projects.

Cooperation with foreign companies, (JOHN DEER, CLAAS, KRONE, KVERNELAND, AG LEADER, GRIMME, JBC, etc), is established through students study trips and excursion. The department performes techical, practical and educational collaboration with domestic companies: PKB - Belgrade; FRIKOM – Belgrade; AGROMEHANIKA - Boljevac…

STAFF 2 professors, 1 teaching assistant, 1 associate
DATE FOUNDED 1948
DISTINGUISHED ALUMNI
- Prof. Vlastimir Novaković, Long-term Head of the Department
- Prof. Stevan Marković, First Lecturer

COPERATION WITH FOREIGN UNIVERSITIES
- Institute Wageningen, Holland
- Northwestern University, USA
- Angel Kanchev University, Rousse, Bulgary
- Technishe Universitat Dresden, Germany
- Institute IMAS, MGAU, VISHOM, MTILP, Moscow, Russia
- European Federation of Chemical Engineering, Working Part of Drying (EFCE-WPD

Tel: +381 (11) 3370 359
Fax: +381 (11) 3370 364
E-mail: dmarkovic@mas.bg.ac.rs
Web site: https://www.mas.bg.ac.rs/ studije/ mas/ modul-10

Full Professor:
Dr. Dragan Marković

Assistant Professor (Dozent):
Dr. Vojislav Simonović

Teaching Assistant:
Ivana Marković

Industrial Engineering

History and Tradition

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, dean of the Faculty of Mechanical engineering 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.

STAFF 9 professors, 3 teaching and research assistants.
DATE FOUNDED 1955
DISTINGUISHED ALUMNI
- Prof. dr Vukan Dešić, Founder of the department
- Prof. dr Vuksan Bulat, Long-term Head of the department
- Prof. dr Milivoj Klarin, , Long-term Head of the department

COOPERATION WITH FOREIGN UNIVERSITIES
- Universidade Nova de Lisboa, Portugal
- University of Southern California, Los Angeles, USA
- Purdue University, West Lafayette, USA
- Aachen University of Technology
- Fraunhofer- Institut fuer Produktionstechnik und Automatisierung, Stuttgart, Germany
- Hochschule fuer Technik & Architektur, Luzern, Switzerland
- Universidade do Minho, Guimaraes, Portugal
- Universita' degli Studi di Messina, Italy

COOPERATION WITH INDUSTRY
- SAP South Eastern Europe
- Tigar tyres d.o.o., Pirot
- West pharmaceutical services Beograd d.o.o., Kovin
- Gecko Solutions d.o.o., Belgrade
- Holcim Srbija d.o.o., Popovac

Education

The Industrial engineering department follows state of the art in the industrial engineering area worldwide. We formed the newest programme of Industrial engineering, 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 companies, almost without an exception, engage knowledge gained in the industrial engineering. As a result of such multidisciplinary approach, graduated engineers from our department find employment in other branches (such as finance, management, banking).

Laboratories

Two laboratories are at students' disposal - the computer laboratory, and the one for the ergonomics and maintenance equipment.

Research

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, safety systems.

Projects

We have realized a great number of projects in cooperation with industry. Large industrial systems and firms from Serbia (such as NIS, Ikarbus, Impol Seval, FIAT, Cooper tyres 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.

Tel: +381 (11) 3302 318
Fax: +381 (11) 3370 364
E-mail: vspasojevic@mas.bg.ac.rs
Web site: http://ie.mas.bg.ac.rs/

Full Professors:
Dr Vesna Spasojević Brkić, Dr Dragan D. Milanović, Dr Mirjana Misita, Dr Aleksandar Žunjić, Dr Uglješa Bugarić, Dr Dušan Petrović, Dr Nikola Dondur

Associate Professors:
Dr Zorica Veljković

Assistant Professor (Dozent):
Dr Tijana Vesić

Teaching and Research Assistants:
Dr Tamara Golubović, Dr Sonja Josipović, Andrija Petrović

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 earths 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.

STAFF 10 profesors, 3 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
- Xidian University, Xian, China
- Rice University Houston, Texas, USA
- Hoahi University, Nanjing, China

Research

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 offerred by the Department in mechanics

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

Sir Isaac Newton (1643-1727)

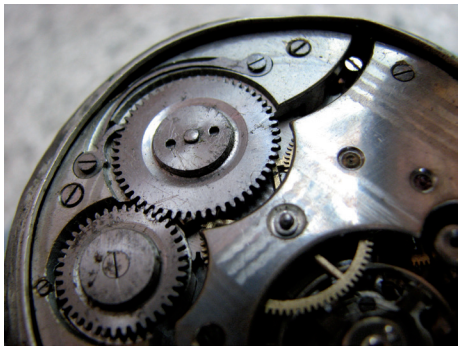
Tel: +381 (11) 3302337
Fax:+381 (11) 3370 364
E-mail: nzoric@mas.bg.ac.rs
Web site: www.mas.bg.ac.rs/obrazovanje/katedre/mehanika/meh-nas-pr.html

Full Professors:
Dr. Olivera Jeremić, Dr. Mihailo Lazarević, Dr. Zoran Mitrović, Dr. Nikola Mladenović, Dr. Aleksandar Obradović, Dr. Mirko Pavišić, Dr. Nataša Trišović.

Associate professors:
Dr. Nemanja Zorić, Dr. Zoran Stokić

Assistant Professors (Dozents):
Dr. Radoslav Radulović.

Teaching Assistant:
Bojan Jeremić, Petar Mandić, Aleksandar Tomović.



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 study specialization 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 production 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 6 units:

1. Laboratory for Mechanisams
2. Laboratory for Machine Dynamics
3. Laboratory for Mechatronics
4. Laboratory for Development, design and automatization of machine for food industry
5. Laboratory for Engineering Graphics
6. Laboratory for Food technology.

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."

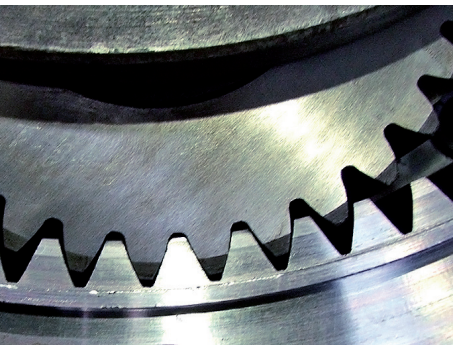
Leonhard Euler (1707-1783)

STAFF 6 professors, 3 teaching assistant
DATE FOUNDED 1979
DISTINGUISHED ALUMNI
- prof. Todor Pantelić, famous lecturer and innovator

COOPERATION WITH FOREIGN UNIVERSITIES
- Techniche Universitat Darmstadt, Germany
- Concordia University, Montreal, Canada

COOPERATION WITH INDUSTRY
- Banini, Kikinda
- Centroproizvod, Belgrade

Tel: +381 11 3370 313
Fax: +381 11 3370 364
E-mail: lmiladinovic@mas.bg.ac.rs
Web site: http://www.mas.bg.ac.rs/

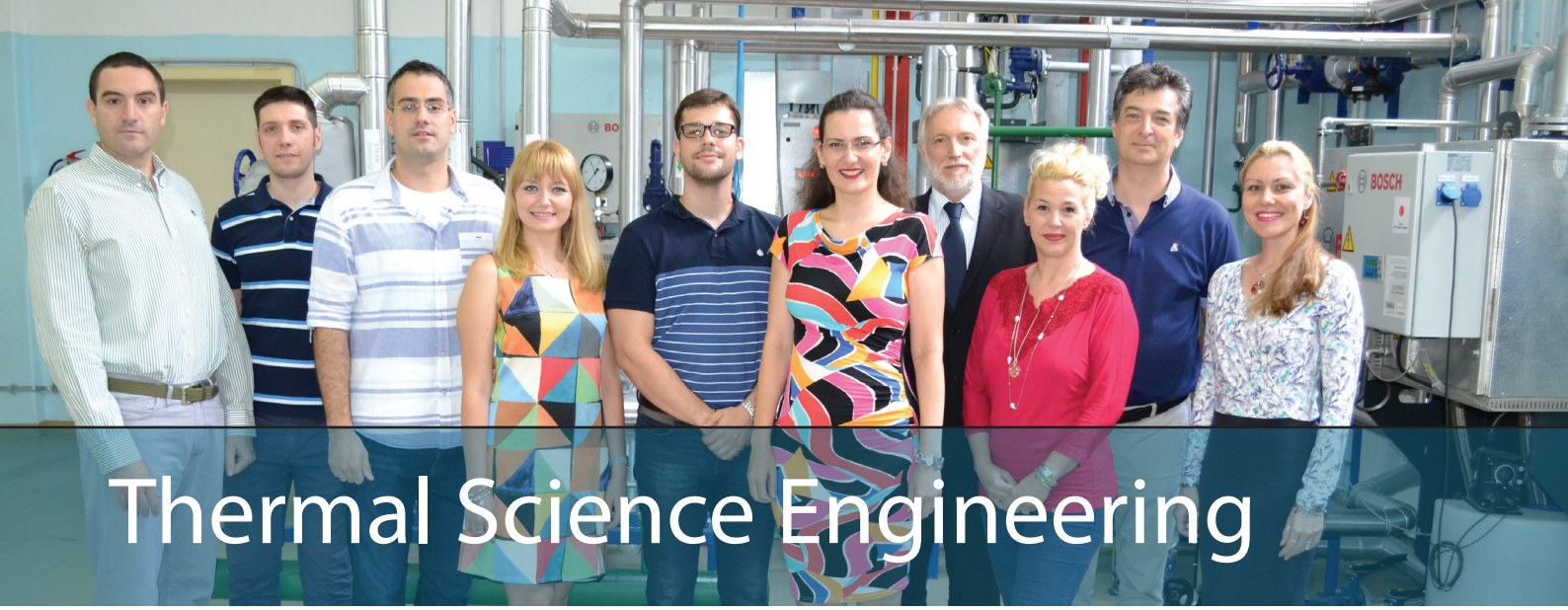


Full professors:
Dr. Ljubomir Miladiović, Dr. Dragan Petrović, Dr. Branislav Popkonstantinović

Associate professors:
Dr. Goran Šiniković, Dr. Zorana Jeli

Assistant professors:
Dr. Emil Veg

Teaching assistant:
Dr. Miša Stojićević, Mladen Regodić, Boris Kosić



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.

History and Tradition

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, 4 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
- Ministary 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.

Research

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.

Cooperation

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 scintific and research work of our Department all of the members are engaged in elaborating energy efficency 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 postgraduate 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.

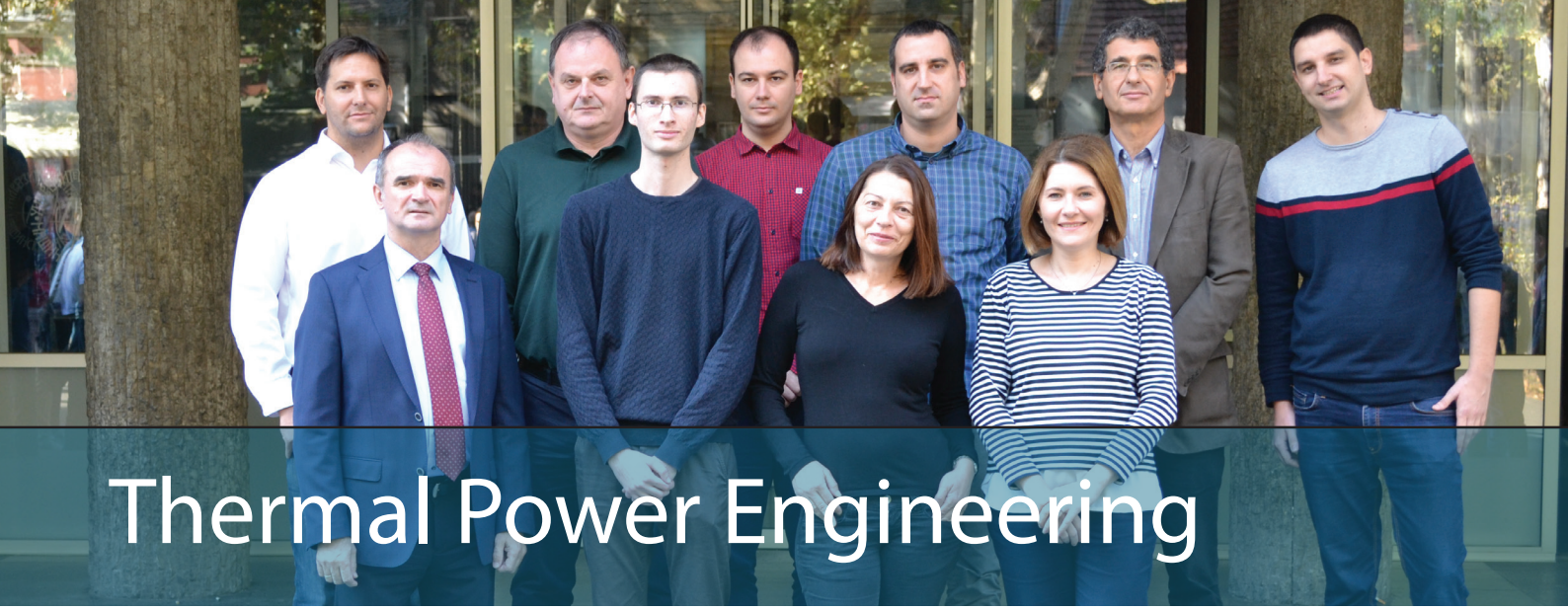
Tel: +381 (11) 3302 445
Fax: +381 (11) 3370 364
E-mail: fkosi@mas.bg.ac.rs
Web site: https://www.mas.bg.ac.rs/organizacija/katedre/7

Full Professors:
Dr. Branislav Živković, Dr. Dragan Tucaković, Dr. Maja Todorović.

Assistant Professor:
Dr. Aleksandra Sretenović, Dr. Goran Stupar, Dr. Tamara Bajc, Dr. Uroš Milovančević.

Teaching and Research Assistants:
Milena Otović, Ognjen Stamenković.

Lab technician:
Nenad Savić



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 stream 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 4 professors, 6 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
- Prof. Novica Vasiljević
- Prof. Nikola Ćuk
- Prof. Milovan Studović
- Prof. Branislav Savić

COOPERATION WITH FOREIGN UNIVERSITIES
- Leibniz Universität Hannover, Germany
- University of Cambridge, United Kingdom
- University of Pennsylvania, Philadelphia, USA
- Florida International University, USA
- Kyoto University, Japan
- JAERI, Japan
- University of California, Santa Barbara, USA
- University of Kentucky, USA
- University of Illinois at Urbana-Champaign, USA

COOPERATION WITH INDUSTRY
- Electric Power Industry of Serbia, Belgrade
- Thermal Power Plants "Nikola Tesla", Obrenovac
- Thermal Power Plants "Kostolac", Kostolac
- "Panonske elektrane", Novi Sad
- Siemens, Erlangen, Germany
- MAN Turbo, Oberhausen, Germany
- General Electric, USA/Switzerland/GermanyRAFAKO S.A., Poland
- Halla Visteon, Germany
- Framatome ANP/AREVA, Germany
- Mitsubishi Hitachi, Japan
- Honeywell Aerospace, USA

Tel: +381 11 3302 265, 3302 365
Fax:+381 11 3370 364
E-mail: mpetrovic@mas.bg.ac.rs
vstevanovic@mas.bg.ac.rs
Web site: https://www.mas.bg.ac.rs/organizacija/katedre/8

Full Professors:
Dr. Milan Petrović, Dr. Vladimir Stevanović.

Assistant Professors:
Dr. Sanja Milivojević, Dr. Milan Banjac

Research Assistant professor:
Dr. Milica Ilić

Teaching and Research Assistants:
Srdjan Milic, Srecko Nedeljkovic, Dejan Djukanovic, Milan M. Petrovic, Djordje Petkovic

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 4 research assistant
DATE FOUNDED 1966
DISTINGUISHED ALUMNI
- Prof. Dragutin Popović, Founder and famous lecturer
- Prof. Branislav Djaković
- Prof. Milan Antić
- Prof. Miloš Kuburović

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.

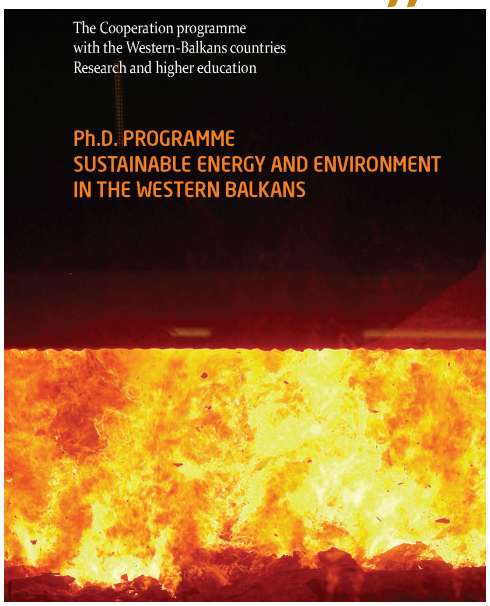
DPE also covers the application of computers in industry, software and hardware design for industrial measurements, process control, introduction of expert systems for process and plant control.

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 fourty years over 1400 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 80 students have completed former postgraduate courses in process engineering obtaining magister degree (Mgr. - 2 year postgraduate degree) and 35 achieved doctoral degree (equivalent to PhD degree).

"The main objective of this project is to contribute to the development of sustainable and environmentally friendly energy systems in the Western Balkan. This is realized trough a development and establishment of the PhD study program inside the field of energy and environmen."



Tel.: +381 11 3302 360
Fax: +381 11 3370 264
E-mail: sgenic@mas.bg.ac.rs
Web site: www.mas.bg.ac.rs
pt.mas.bg.ac.rs

Full Professors:
Dr. Srbislav Genić, Dr. Aleksandar Jovović, Dr. Aleksandar Petrović, Dr. Dejan Radić.
Associate Professors:
Dr. Nenad Mitrović.
Assistant Professor (Dozents):
Dr. Marko Obradović, Dr. Mirjana Stamenić, Dr. Dušan Todorović
Teaching Assistants:
Nikola Karličić, Miloš Ivošević.
Research Assistants:
Nikola Tanasić, Dr. Marta Trninić, Tomislav Simonović, Dr. Martina Bogner..

Thermomechanics

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

The main task of the Department is to provide provide students of bachelor and master studies, as well as PhD students detailed survey of the modern theoretical and professional knowledge in: Thermodynamics B, Applied thermodynamics, Fundamentals of heat transfer, Basics of solar systems, Thermodynamics M, Transport phenomena, Heat and substance transfer, Solar energy, Thermodynamics of chemical processes, Advanced course transport phenomena and analogies, Statistical thermodynamics, Thermodynamics of irreversible processes, Thermodynamics of multicomponent systems, Entropy-exergy analysis of process and equipment efficiency, Lab/in-situ measurements in thermomechanics, Advanced course in heat transfer, Numerical methods in thermomechanics.

The Department of Thermomechanics experimental facility includes:

1. Solar thermal system with different types of collectors
2. Experimental system for determination of thermomechanical changes in the aquifer during the ground source heat pump operation
3. Calibrated Hot Box experimental installation
4. Geothermal heat pump with model room for energy efficiency testing

Along with teaching, facility/staff of the Department of Thermomechanics have been, actual, conducting research projects funded by the Ministry of Education, Science and Technological Development of the Republic of Serbia. Recently, research areas include highly actual problems of use of renewable energy sources - solar and geothermal energy; energy efficiency; drying prosess as well transport phenomena in porous media. The Department currently take a part in a few domestic and EU projects.

STAFF 6 professors, 1 teaching assistant
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 textbooks in Serbian
- Prof. Fran S. Bošnjaković, World famous lecturer and scientist
- Prof. Dimitrije K. Voronjec

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
- University of Perugia, Italy

"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.

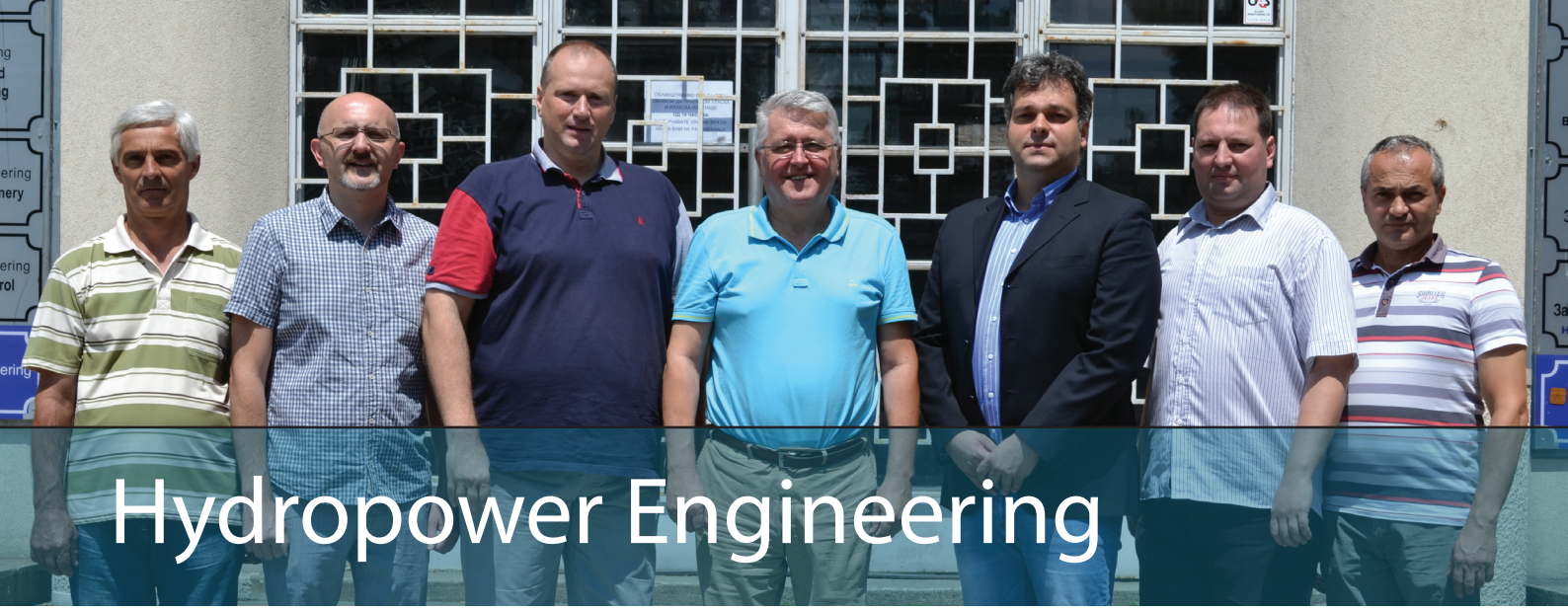
Tel: +381 11 3302 344
Email: mbanjac@mas.bg.ac.rs
Web site: https://www.mas.bg.ac.rs/organizacija/katedre/10

Full Professor:
Dr. Miloš Banjac, Dr. Mirko Komatina

Associate Professor:
Dr. Milan Gojak, Dr. Aleksandar Saljnikov

Assistant Professor (Dozents):
Dr. Nedžad Rudonja, Dr. Ružica Todorović,

Teaching assistant:
Srđan Otović



Hydropower Engineering

History and Tradition

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.

Laboratories

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.

STAFF 4 professors, 1 reasearch assistant, 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

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.

Cooperation

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 Alexsander - Universität Erlangen - Nürnberg, Germany; University of Resita, Engineering Faculty, Romania; Technical University, Timisoara, Romania, Institut für Strömungslehre und Strömungsmachinen, Universität Karlsruhe, Germany; D'Ecole Nationale Superiere d'Electricite et de Mecanique, (ENSEM), Nancy, France; Tohoku University, Japan; Госстрой России, Сантехниипроект. инсститут-Москва, Русија; 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.

Education

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.

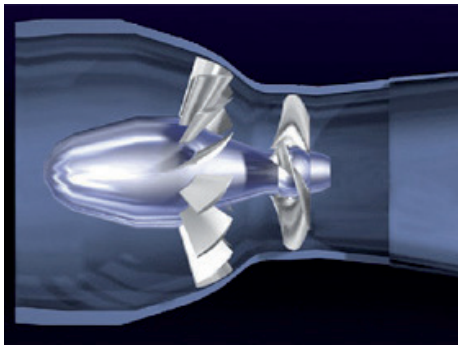
Tel: +381 11 3302 401
Fax: +381 11 3370 364
E-mail: mnedeljkovic@mas.bg.ac.rs
Web site: https://www.mas.bg.ac.rs/organizacija/katedre/11

Full Professors:
Dr. Miloš Nedeljković.

Associate Professors:
Dr. Đordje Čantrak, Dr. Ivan Božić.

Assistant Professors:
Dr. Dejan Ilić.

Research Assistant:
Novica Janković.



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.

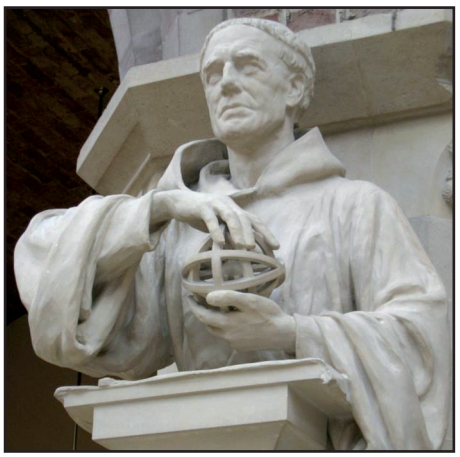
The main research areas of our Department are: Numerical Analysis, Nonlinear functional analysis, Mathematical logic, Scientific computing, Signal processing, Information systems and Relational database systems.

STAFF: 9 professors, 4 teaching and research assistants

COOPERATION WITH FOREIGN INSTITUTIONS

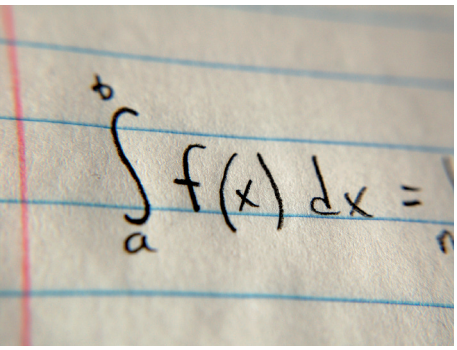
- Kent State University, USA
- University of La Laguna, Tenerife, Spain
- Universidad Politecnica de Madrid, Spain
- University of Maryland, USA
- Vienna University of Technology, Austria
- Bradley University, USA
- Indiana University, USA
- King Abdul Aziz University, Saudi Arabia
- Universita di Palermo, Italy
- Texas AM University-Kingsville, USA

"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)

Tel: +381 11 3370 377
Fax: +381 11 3370 364
E-mail: mspalevic@mas.bg.ac.rs
Web site: https://www.mas.bg.ac.rs/organizacija/katedre/12



Full Professors:
Dr. Miodrag Spalević, Dr. Aleksandar Cvetković, Dr. Slobodan Radojević, Dr. Ivan Aranđelović.

Associate Professors:
Dr. Dragan Doder, Dr. Goran Lazović, Dr. Aleksandar Pejčev.

Assistant Professors (Dozents):
Dr. Davorka Jandrlić, Dr. Dušan Đukić.

Teaching and Research Assistants:
Slaviša Pantelić, Jelena Tomanović, Rada Mutavdžić, Miloš Vučić.

Control Engineering

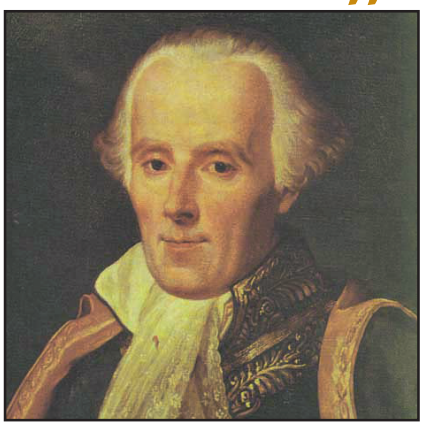
Over the many years, since the Department was established, members of the Department of Automatic Control have been taking a part in the rich and diverse development in almost every field of the automatic control, from scientific fundamentals to the application of solutions in the industry, which led to the many significant published papers and many technical solutions, which consequently granted wide recognition in academic and industrial structures.
Research projects were financed by the state and through the direct cooperation with the domestic and foreign companies, located not in only in Serbia, but worldwide.

PROJEKTI:

- Accompanying control systems in electrical-hydraulic and electrical-pneumatic systems
- Building management systems
- Electromechanical actuation systems

Development of the new control concepts and control algorithms for securing better closed-loop system performance, whether in general, or in specific cases, for specific plants, is still the main objective for every Department employee.
Students at the Department of Automatic Control are offered a variety of courses, starting at the second year of Basic Academic Studies, through elective subjects and one mandatory subject, where rich curriculums encompass control theory, working principles of sensors, actuators and computer controlled systems. Also, students can become acquainted with mathematical modelling of the systems and programming in MATLAB and Simulink.
At the Master Academic Studies, rich basic knowledge is further enlarged through additional mandatory and elective courses organized by the Department of Automatic Control. Starting with deeper understanding of control theory and computer controlled systems working principles, students also gain knowledge from the field of fuzzy control systems, at the same time learning to simulate work of all those systems, using computer. Besides analysis of the linear system performance, students are taught control system design for linear systems. Also, mandatory courses cover study of nonlinear effects, unavoidable in every physical system. Specific class of controllers, programmable logic controllers (PLCs), programming is one of the main course outcomes of industrial automation course. Bio-automation, robot mechanics, and mechatronics in general, intelligent buildings, neural networks, used for the identification and control, are also some of the topics covered through courses available. Low price of microcontrollers nowadays makes this technology available to everyone and since they are widely used in the control practice, this makes possible that every student has an opportunity to implement and test own control algorithms through laboratory exercises.
Our department runs study specialization: Control engineering

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



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

STAFF 6 professors, 2 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, Inovations in Exploatation of Circuits

COOPERATION WITH FOREIGN UNIVERSITIES

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

COOPERATION WITH INDUSTRY

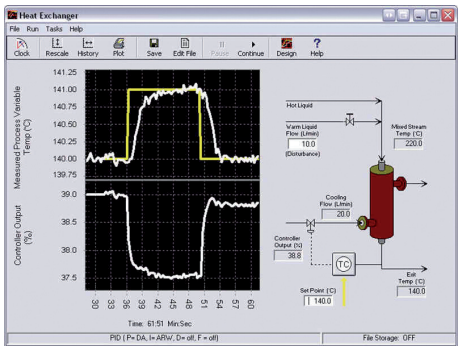
- Elektroprivreda Srbije
- Siemens d.o.o. Beograd
- Tetra Pak Production d.o.o. Beograd

Tel: +381 11 3370 242
Fax: +381 11 3370 364
E-mail: zribar@mas.bg.ac.rs
Web site: au.mas.bg.ac.rs

Full Professors:
Dr. Zoran Bučevac, Dr. Zoran Ribar, Dr. Dragan Lazić.

Associate Professor:
Dr. Milan Ristanović, Dr. Radiša Jovanović, Dr. Srđan Ribar.

Teaching and Research Assistants:
Vladimir Zarić, Goran Petrović.



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;
- 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;
- polymer nanocomposites, nano- and microceramic materials, development of advanced functional materials.
- electric and control system design for power and industrial plants

STAFF 9 professors.
DATE FOUNDED 1948. DISTINGUISHED ALUMNI

- Academician Petar Miljanić (1927-2015), Long term Head of the department
- Prof. Dragan Kandić, retired

COOPERATION WITH FOREIGN UNIVERSITIES

- Moscow State University MGU, Russia
- Rutgers University, New Brunswick
- University of California, Berkley, USA
- North Carolina Central University, NASA – CREST (NASA University Research Center – Center for Research Excellence in Science & Technology), USA

COOPERATION WITH INSTITUTES & INDUSTRY

- Vinča Institute of Nuclear Sciences, Military Academy Belgrade, Military Technical Institute, Institute of Phys¬ics, Faculty of Physics, Faculty of Electrical Engineering, Faculty of Technology and Metallurgy, Institute for Multidisciplinary Research, Institute of Technical Sciences of the Serbian Academy of Sciences and Arts; Belgrade
- Fresenius Medical Care, Vršac;
- EPS Corporation
- MSK "Kikinda"
- Siemens Serbia

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 and Physics
- Control Systems
- Digital signal processing

"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)

Tel: +381 11 3302 207
Fax: +381 11 3370 364
E-mail: ztrifkovic@mas.bg.ac.rs
Web site: http://www.mas.bg.ac.rs/organizacija/katedre/14

Full Professors:
Dr Dobrila Škatarić, Dr Zoran Trifković, Dr Aleksandra Vasić-Milovanović, Dr Jasmina Jovanović, Dr Jelena Ilić, Dr Petar Lukić

Associate Professors:
Dr Tomislav Stojić, Dr Vera Pavlović

Fluid Mechanics

Education

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.
- 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.

STAFF 5 professors, 1 teaching and 3 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
- Prof. Svetislav Čantrak

COOPERATION WITH FOREIGN UNIVERSITIES
- University of Southern California, Los Angeles, USA
- University of Algiers, Algier
- University of Karslruhe, Karslruhe
- University of Freiburgh, Freiburgh, Germany
- University of Poitiers, ENSMA, France
- University of Vallenciennes, France

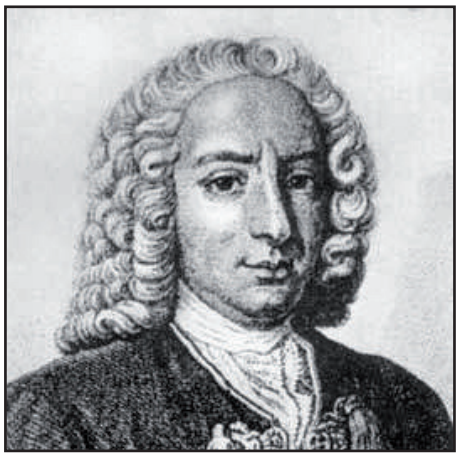
COOPERATION WITH INDUSTRY
- Etamic, Paris, France
- SILEC, Paris, France

Research

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)

Tel: +381 11 3302-304
Fax: +381 11 3302-364
E-mail: ccrnojevic@mas.bg.ac.rs
acocic@mas.bg.ac.rs
Web site: http://fluidi.mas.bg.ac.rs/

Full Professors:
Dr. Cvetko Crnojević, Dr. Milan Lečić, Dr. Nevena Stevanović.

Associate Professor:
Dr. Snežana Milićev, Dr. Aleksandar Ćoćić.

Teaching Assistant:
Milan Raković.

Research Assistants:
Darko Radenković, Iva Guranov, Jela Burazer.

Aerospace Engineering

History & Tradition

The Department of Aerospace Engineering is a truly multidisciplinary, regional centre of aeronautical engineering with educational, research and development activities focused on flight vehicles problems including methods and means of their design, computation, manufacturing and maintenance.

Since the beginning of aerospace engineering in Serbia and the foundation of this department, the main goal - to make a significant contribution to the development of aerospace industry - has been achieved through the implementation of new, innovative solutions and with the full dedication of the staff.

Education

Constant tendency of the Department of Aerospace Engineering is to develop and improve the teaching process, to catch up with the leading universities worldwide and to meet the always new and exciting challenges and demands in the field of aerospace engineering. The complexity of modern aircrafts, the level of technological development and continuous endeavours of the department towards improvements in order to make the educational process as efficient as possible led to certain changes in the syllabus and in the teaching programmes. The courses are organized and performed in a way similar to other relevant European universities and the students are treated as our future partners and associates.

STAFF: 13 professors, 3 teaching and research assistants.
DATE FOUNDED: 1921
DISTINGUISHED ALUMNI:
- Prof. Miroslav Nenadovic, a member of Serbian Academy of Sciences and Arts,
- Prof. Dusan Stankov, CTO of the Aeroplane factory Zmaj, Zemun,
- Prof. Sima Milutinovic, CTO of the First Serbian Aeroplane factory Rogozarski, Belgrade.

COOPERATION WITH FOREIGN UNIVERSITIES:
- University Al-Fatah, Libya,
- University of Illinois, Urbana-Champaign, USA,
- Technical University, Prague, Czech Republic.

COOPERATION WITH INDUSTRY:
- AIR Serbia, Belgrade,
- Boeing, Seattle, USA,
- VTI Zarkovo, Belgrade,
- VZ Moma Stanojlovic, Belgrade.

Laboratories

The Department encompasses many laboratories and equipment for providing experiments for both teaching and research and development purposes.

Our research facilities include:
- Laboratory for subsonic aerodynamics – Wind tunnel „Miroslav Nenadović“
- Laboratory for supersonic aerodynamics
- Laboratory for avionics
- Laboratory for jet propulsion,
- Laboratory for structural analysis,
- Laboratory for aeroelasticity
- Laboratory for CFD
- Laboratory for numerical analysis of structures,
- Laboratory for composite structures,
- Laboratory for computer and information technologies

The Department recently obtained new, complex equipment that made both educational and research work even more useful and effective.

Research & Development

Research and development activities are focused on advanced fields of aerospace engineering, in particular:
- Aerodynamics,
- Design and Structural Analysis,
- Avionics,
- Propulsion,
- Wind turbines.

The research and development achievements realized through innovative approaches resulted in various projects and products and successful cooperation with numerous industrial partners.

Projects (From The Reference List)

airplane GALEB, airplane JASTREB, airplane ORAO, airplane SUPER GALEB, airplane KRAGUJ, airplane LASTA, airplane UTVA 75, airplane Moma 86, Mi-8 helicopter main rotor composite blade, Gazelle helicopter main rotor composite blade, Trisonic wind tunnel T-38, Hypersonic wind tunnel VTI, Composite Vuk-T Glider, Very light rotorcraft H135, Wind turbine SAZ-15, AH M08 KNIGHT military helicopter – conceptual design, AH M10 RAIDER military helicopter – conceptual design, FFROG light sports amphibian aircraft – conceptual design, Design and manufacturing of moulds for composite blades

Tel: +381 11 3370 336
Fax: +381 11 3370 364
E-mail: cmitrovic@mas.bg.ac.rs
Website: http://vaz.mas.bg.ac.rs/

Full Professors:
Dr. Vasko Fotev, Dr. Časlav Mitrović, Dr. Nebojša Petrović, Dr. Ivan Kostić. Dr. Aleksandar Bengin, Dr. Aleksandar Simonović.

Associate Professors:
Dr. Danilo Petrašinović, Dr. Mirko Dinulović, Dr. Aleksandar Grbović.

Assistant Professors (Dozents):
Olivera Kostić, Goran Vorotović, Ognjen Peković, Jelena Svorcan.

Teaching Assistants:
Toni Ivanov, Miloš Vasić, Maja Rosić

Weapon Systems

Education

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.

Laboratories

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

STAFF 4 professors, 2 teaching assistants
DATE FOUNDED 1948
DISTINGUISHED ALUMNI
- Prof. Boško Stanisavljević
- Prof. Obrad Vučurović
- Prof. Aleksandar Stamatović

Innovations in Weapons
- Anastas Paligorić, Dipl. Ing.

COOPERATION WITH FOREIGN UNIVERSITIES
- Imperial College, London, UK
- Beijing Institute of Technology, Beijing, China
- Purdue University, West Lafayette, USA
- ENSTA, Paris, France
- Cranfield University, UK
- Bauman, Moscow, Russia

COOPERATION WITH INDUSTRY
- Military Technical Institute, Belgrade
- Technical Testing Center, Belgrade
- Sloboda, Čačak
- Prvi partizan, Užice
- Krušik, Valjevo
- Zastava Arms, Kragujevac
- Prva iskra, Barič
- Milan Blagojević, Lučani
- Jugoimport SDPR, Belgrade

Research

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.

Goran Bregovic "Kalashnikov"

"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 -)

Tel: +381 (11) 3302 341
Fax: +381 (11) 3370 364
E-mail: dmickovic@mas.bg.ac.yu
Web site: https://www.mas.bg.ac.rs/organizacija/katedre/17

Full Professors:
Dr. Momčilo Milinović, Dr. Dejan Micković, Dr. Predrag Elek

Assistant Professor:
Dr. Ivana Todić

Teaching assistants:
Dr. Miloš Marković, M.Sc. Dejan Jevtić

Naval Architecture

History and tradition

The Department of Naval Architecture was founded in 1948 and is the only such department in Serbia today. The founder of the Department was Academician Jakov Hlitčijev. He was followed by a number of distinguished professors and experts in different fields of naval architecture.

Over the past decades, the growth of Serbian shipbuilding industry was significant, resulting in completion of more than 2300 seagoing ships and inland vessels that today operate worldwide. This would have not been 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, made a career at foreign universities, research facilities, institutes, classification societies and shipyards all over the world. Some of them have successfully continued their postgraduate and doctoral studies in the Netherlands, Great Britain, Italy, Denmark, Canada, USA and other countries.

Education and research

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, manoeuvring, 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.

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. In addition to the measurements performed on vessels on the Danube and Sava, this equipment was also used for diverse measurements worldwide: vessels on the Irawadi River in Burma, in the Bay of Bengal, etc.

Notable research areas and projects include: development of risk-based ship stability regulations (for which members of Department were awarded with RINA-Lloyd's 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; innovative design of shallow draught inland vessels; safety of autonomous ships, etc.

STAFF 4 professors, 2 teaching and research assistants
DATE FOUNDED 1948
DISTINGUISHED ALUMNI
- Academician Jakov Hlitčijev, First Head and founder of the Department

DISTINGUISHED PROFESSORS
- Prof. Stevan Stević, Founder of the Department
- Prof. Nenad Zrnić, member of Serbian Academy of Science and Arts
- Prof. Borivoje Ribar
- Prof. Borislav Džodžo
- Prof. Branislav Bilen
- Prof. Milan Hofman
- Prof. Dejan Radojčić

COOPERATION WITH FOREIGN UNIVERSITIES
- University of Southampton, United Kingdom
- Delft University of Technology, The Netherlands
- University of Trieste, Italy
- Budapest University of Technology and Economics, Hungary
- National Technical University of Athens, Greece

COOPERATION WITH INDUSTRY
- Development Centre for Ship Technology and Transport Systems (DST), Duisburg, Germany
- Maritime Research Institute (MARIN), Wageningen, The Netherlands
- Bureau Veritas Inland Navigation Management (DNI), Antwerp, Belgium
- Via Donau, Vienna, Austria
- Shipyard Vahali, Sremska Mitrovica, Serbia

Tel: +381 11 3302 320
Fax:+381 11 3370 364
E-mail: mmotok@mas.bg.ac.rs
Web site: www.mas.bg.ac.rs/organizacija/katedre/18
www.brodogradnja.org
www.facebook.com/brodogradnja

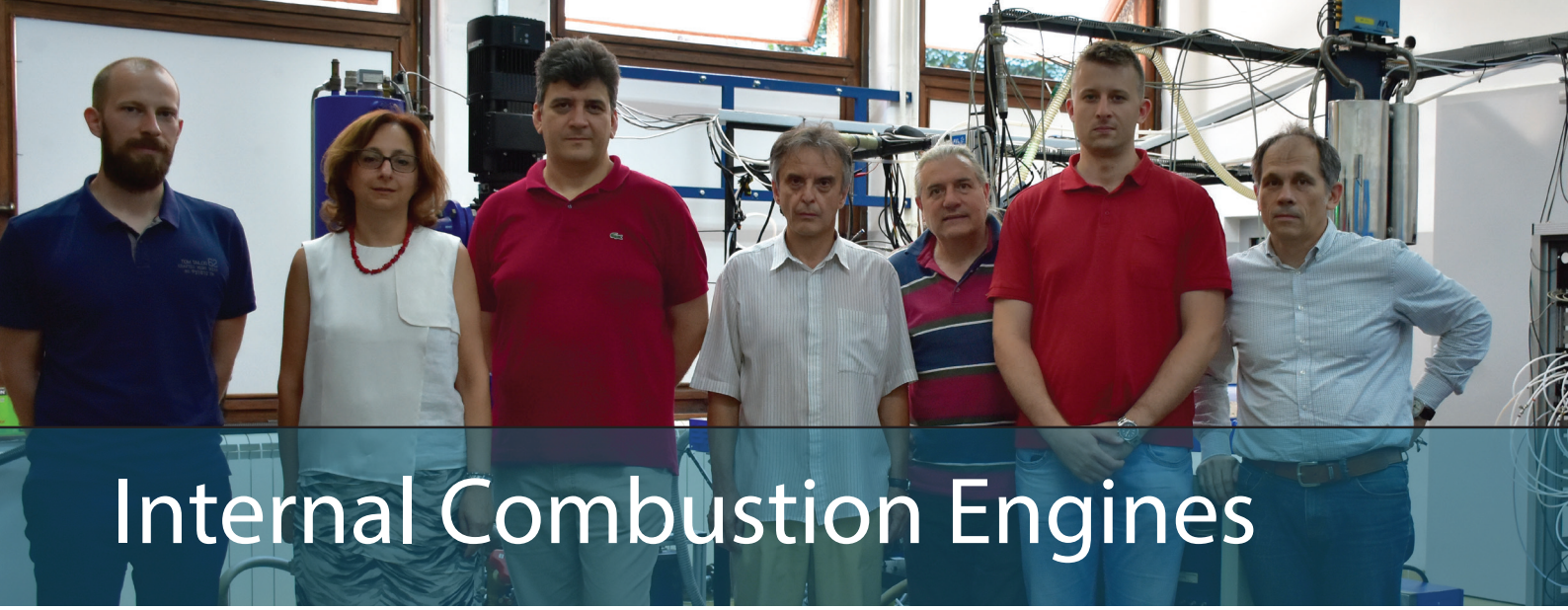
Full Professors
Dr. Milorad Motok

Associate Professors
Dr. Igor Bačkalov

Assistant Professors
Dr. Milan Kalajdžić, Dr. Nikola Momčilović, Dr. Aleksandar Simić

Teaching and Research Assistants | PhD Students
Stefan Rudaković, Milica Vidić

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 the University of Belgrade date back to 1919, just after the WW-I. It was only 22 years after Rudolf Diesel managed to operate his engine successfully for the first time,. Education and research have been enriched and supported widely with a dedicated lab facility built in early 1931. Standing on its long history and tradition, the Internal Combustion Engines Department (ICED) 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.

STAFF 2 associate professors, 1 assistant professors, 2 teaching and research assistants
DATE FOUNDED 1948 (lectures from 1897)
DISTINGUISHED ALUMNI

- Prof. Dr Miroljub Tomić, Long-term Head of the department and engine numerical models simulation expert.
- Prof. Dr Stojan Petrović, Long-term Head of the department and internationally recognized engine emission expert.
- Prof. Dr Rade Jankov, ICED, Famous lecturer and pioneer in numerical model simulation and computer based measurements in engines.
- Prof. Dr Radivoje Trifunović, ICED, Famous lecturer and innovator
- Prof. Dr Dušan Gruden, PORSCHE AG, Well known expert
- Prof. Dr Zoran Filipi, Clemson University, USA, 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 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
- BIT, Beijing, PR China

Education

The field of ICE grows continually and develops faster than ever in every aspect of engine design, process understanding and control, efficiency, manufacturing and maintenance. Today, defining the main educational goals for an engine specialist is an extremely challenging, demanding and, most of all, responsible task. Having in mind that the I.C. engine is a heat machine, we believe in a 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, give our students unique and real opportunity to learn, feel and experience in vivo many aspects of ICE testing and to participate in our research projects.
Based on current requirements and global technical knowledge and achievements, the lectures, both class and laboratory, are continually updated every year, and are particularly suited to an engineer intending to work in the field of ICE in the future.

Laboratory

The ICED encompasses 13 engine test cells with eddy current and AC asynchronous dynos, state-of-the-art single-cylinder research engine cell for advanced combustion systems R&D, exhaust gas emission lab, computation and numerical simulation lab, fuel injection and mixture formation lab, high capacity multi-purpose valve/port flow bench, compressor and turbocharger test lab.

Research

The ICED focuses on research mainly in the fields of: • IC engine simulation techniques; • Turbo-charging; • Mechatronic systems and techniques applied to engine control and diagnostics; • Development of IC engine testing and advanced measurement techniques; • Hybrid powertrain systems; • Engine fuels.

Projects (from the reference list)

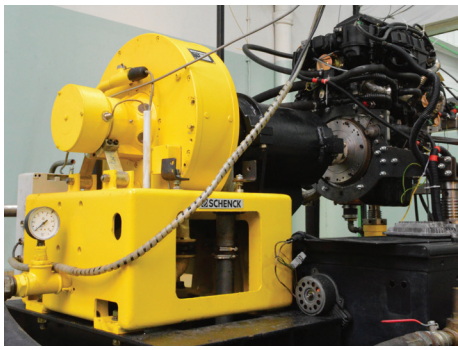
• Development of Turbocharged SI engine; • Research & Development of High-pressure diesel injection system; • Research & Development of a range of Turbochargers for CI engines; • Hybrid powertrain systems for City Buses and Refuse Trucks; • Engine fuels testing; • Development and Testing of engine test bed instrumentation and systems (in coop. with AVL GmbH); • Research and Development of innovative combustion systems in Gasoline engines (in coop. with AVL GmbH)

Tel: +381 11 3302 417
E-mail: nmiljic@mas.bg.ac.rs
Web site1: https://www.mas.bg.ac.rs/organizacija/katedre/19
Web site2: motori.mas.bg.ac.rs

Associate Professors:
Dr. Slobodan Popović, Dr. Nenad Miljić

Assistant Professor:
Dr. Dragan Knežević

Teaching and Research Assistants:
Marko Kitanović, Predrag Mrđa



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 wide-ranging branch of engineering, encompassing electronics, computing, materials science and ergonomics, as well as the traditional core subjects of mechanical engineering science.

STAFF 6 professors, 2 teaching assistants
DATE FOUNDED
1946
DISTINGUISHED ALUMNI
- Prof. Aleksej Lebedev, first motor vehicle lecturer
- Prof. Milan Cvetnić
- Prof. Miroslav Nenadović
- Prof. Mihailo Borisavljević
- Prof. Jovan Todorović
- Prof. Dimitrije Janković
- Prof. Nenad Janićijević
- Prof. Čedomir Duboka
- Prof. Gradimir Ivanović
- Prof. Živan Arsenić

COOPERATION WITH FOREIGN UNIVERSITIES
- Cranfield University
- University of Montenegro
- University of East Sarajevo
- University of Skopje

COOPERATION WITH INDUSTRY
- Tractors and Farm Equipment Limited, India
- RDW, The Netherlands
- TBV, Germany
- Uniplast Serbia
- and many more...

The objective of the Department is an advanced education of students able to create products which in the near and distant future will meet and satisfy the needs of the user. New technologies, such as integrated active and passive vehicle safety systems, application of new materials and electronic components in addition to new vehicle drive systems (electric, hybrid, etc.) impose challenging engineering problems for the future, requiring a broadly based multidisciplinary education.

The Motor Vehicle Department is concerned with all aspects of R&D of motor vehicles and their trailers both from education at BSc, MSc, and PhD levels, 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 1400 students have graduated from the Motor Vehicle Department. Students at our Department can follow the following courses:
- Fundamentals of Motor Vehicles,
- Vehicle Systems,
- Vehicle Dynamics,
- Vehicle Performances,
- Vehicle Design 1,
- Vehicle Design,
- Skill Praxis B,
- System Effectiveness,
- Vehicle Propulsion Systems,
- Automotive Frictional Systems,
- Vehicle Mechatronics,
- Vehicle Testing,
- Vehicle Safety,
- Intelligent Vehicle Systems,
- Vehicles and Environment,
- Vehicle Maintenance,
- System Engineering,
- Forensic Engineering,
- Skill Praxis M, 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:
- CIAH Laboratory,
- CESiL - Center for System Effectiveness and Logistics,
- LaBMV – Laboratory for Motor Vehicles Safety.

Tel: +381 (11) 3302 487
Fax: +381 (11) 3302 487
E-mail: dstamenkovic@mas.bg.ac.rs
Web site: www.mas.bg.ac.rs/organizacija/katedre/20

Full Professors:
Dr. Branko Vasić, Dr. Branislav Rakićević, Dr. Vladimir Popović, Dr. Dragan Aleksendrić

Associate Professors:
Dr. Saša Mitić, Dr. Ivan Blagojević

Teaching Assistants:
Dragan Stamenković, Darko Stanojević

Railway Mechanical Engineering

Research and Education

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,
- Russian Federation,
- Greece,
- Croatia,
- Slovenia,
- Iran.

STAFF 4 professors.
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

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 an example of recently finished research projects we can mention the development of elements for energy absorption in case of railway vehicles accidents. Design, calculation methodologies and technology of hydrodynamic couplers for railway traction vehicles were researched as well. Many analyses and research projects were performed using specialized software partially developed at the Faculty, such as: gauge calculation, strength FEM calculations in elastic and plastic area, calculations of suspension, calculation of forces in buffers and draw gear in curves, calculation of eigenvalues and calculation of ride stability, derailment safety, guiding forces in curves, wheel wear index etc.

Testing

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 the majority of required measuring equipment.

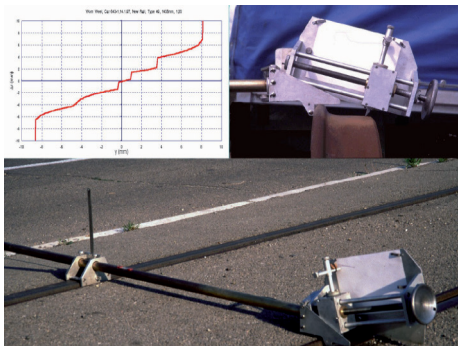
Recently the following tests have been performed:

- 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 EN and UIC standards, 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.rs
Web site: http://www.mas.bg.ac.rs/obrazovanje/odseci/zm/odseci-zm.html

Full Professors:
Dr. Vojkan Lučanin, Dr. Goran Simić
Associate Professors:
Dr. Dragan Milković, Dr. Jovan Tanasković



General Machine Design

The Department of General Machine Design deals with the machine system components of great importance for all mechanical engineering fields, as well as with the design of machines and their assemblies, subassemblies and elements. Some of the research fields covered by the Machine Design Department scope include Machine elements (gears, bearings, shafts, mechanical joints, etc.), Failure analysis (fatigue, endurance, and strength), Vibration and noise generation, and Design of machine systems (product development, prototyping and 3D printing, design parameters optimization - such as multi-criteria optimization methods, including genetic algorithm optimization), etc. The Department has been a vital part of the Faculty of Mechanical Engineering since its foundation. It's courses provide a broad basis of knowledge and practical and analytical skills needed to become a successful mechanical engineer.

The Department possesses cutting-edge testing equipment intended for students of all study levels, as well as for scientific research and investigation. Experimental research is performed in laboratories oriented towards different engineering materials, parts and elements testing (such as standardised test samples, models and real machine components). Currently, the Department comprises the following laboratories: 1. Accredited (certified) Laboratory for bearings (LiMES) SRPS ISO 1132-1:2016, SRPS ISO 1132-2:2017, SRPS ISO 15242-1,2,3:2018, SRPS EN ISO 6508-1:2018; 2. Laboratory for gears and gear drives; 3. Laboratory for machine elements; 4. Laboratory for machine design (LECAD) - member of the International Consortium for Engineering Design - LECAD Group; 5. Laboratory for fatigue and strength (LiMES); 6. Laboratory for vibration and noise; 7. Laboratory for hybrid technical systems.

Research

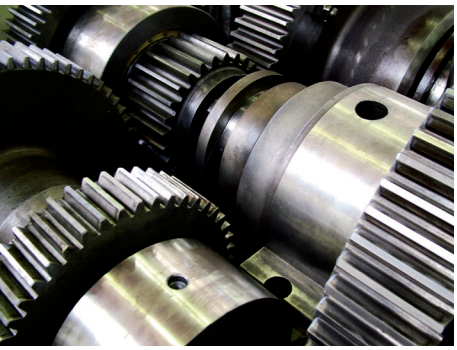
Research in the area of Machine elements is mostly focused on gears and gear drives, which include bearings, shafts, couplings, fasteners, springs, belt and chain drives, as well as friction drives, Gears' research includes gear teeth geometry, durability, endurance, strength, operational loads (stress spectrums), vibrations and noise emissions, etc.. Research in the area of structural integrity focuses on failure probability of gears, screws and bolts, connecting rods and other machine parts. For this purpose, besides back-to-back gears test rigs, a servo-hydraulic machine for static and dynamic testing is applied. Research in the failure theory area covers an analysis of crack initiation and propagation processes, and the hypothesis of damage accumulation, as well as the application of modern numerical methods includes modelling and the Finite Elements Method (FEM) analysis. The students are regularly introduced to research activities, especially to the experimental research performed by the Department members. Consequently, students get familiar with the machine components testing methods, and become capable of designing and performing some experimental investigations on their own.

STAFF 8 professors and 3 teaching assistants.
DATE FOUNDED 1948.
DISTINGUISHED ALUMNI
- Dušan Vitas, Milan Trbojević, Slobodan Veriga, Zoran Savić, Vera Krsmanović, Momčilo Janković
- Vojislav Latinović, Pauna Obradović, Nedeljko Plavšić, Miodrag Janković, Aleksandar Subić
- Emeritus Prof. Milosav Ognjanović
- MEMBER OF THE SERBIAN ACADEMY OF SCIENCES AND ARTS
- Prof. Vladimir Farmakovski

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
- Slovak University of Technology in Bratislava, Slovakia

COOPERATION WITH INDUSTRY
- Goša, Smederevska palanka
- TENT, Obrenovac
- TEKO, Kostolac
- FKL, Temerin
- Messer-Tehnogas AD, Beograd
- EDePro, Beograd

Tel: +381 11 3302 473
Fax: +381 11 3370 364
Email: mristivojevic@mas.bg.ac.rs
Web site: omk.mas.bg.ac.rs/



Full Professors:
Dr. Mileta Ristivojević, Dr. Radivoje Mitrović, Dr. Božidar Rosić, Dr. Tatjana Lazović, Dr. Marko Miloš.

Associate Professors:
Dr. Aleksandar Marinković, Dr. Zoran Stamenić.

Assistant Professor:
Dr. Žarko Mišković.

Teaching Assistants:
Dr. Nenad Kolarević, Aleksandar Dimić, Miloš Sedak.

Engineering Materials and Welding, Tribology, Fuels and Combustion

Education and research activities of the Department (since 1973), include three engineering areas: Engineering Materials and Welding; Tribology; Fuel 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. Advanced materials (polymers, ceramics, composites, biomaterials and nanomaterials) 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 the 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, the microstructure, material properties and n-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. The science of welding is also an important aspect of our activities. Research activities in the Laboratory of Engineering Materials and Welding include: service behaviour and testing of all kind 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 completed EUREKA projects.

STAFF 11 professors, 2 teaching and research assistants, 1 associates
DATE FOUNDED 1966.
DISTINGUISHED ALUMNI
- Danilo Dančević, Borivoj Manojlović, Svetislav Janać, Avram Majstorović, Vitomir Đorđević
- Prof. Anđelka Milosavljević
- Prof. Vera Šijački-Žeravčić
- Prof. Aleksandar Rac
- Academician Dušan Veličković
- Prof. Milan Radovanović
- Prof. Emeritus Miroljub Adžić

COOPERATION WITH FOREIGN UNIVERSITIES
- Institute Karpenko, Ukraine
- Institute for Welding, Timisoara, Romania
- Drexel University, Philadelphia, USA
- IST Lisbon, Portugal
- University of Leeds, UK
- University of Maribor, Slovenia
- Aristotle University of Thessaloniki, Greece
- Technical University of Sofia, Bulgaria

COOPERATION WITH INDUSTRY
- Electric Power Industry of Serbia, Serbia
- US Steel Serbia
- Petroleum Industry of Serbia

Tribology

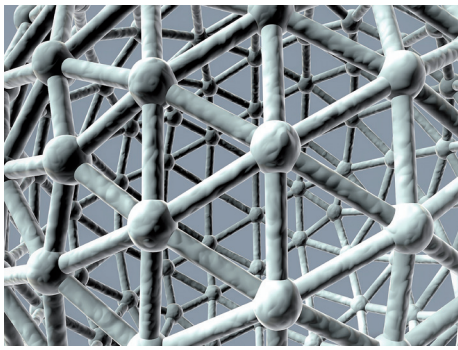
Tribology Laboratory (TriboLab) is dedicated to education and research in all the aspects of tribology. Interdisciplinary character of the tribology and presence of tribological processes in most of mechanical systems demand researches in all fields of industry, where tribological activities can achieve significant technical and economical effects. The main research activities of TriboLab are: Friction and wear characteristics of materials (metals, polymers, ceramics and composites); Surface modifications and coatings; Lubricants – application, recycling and monitoring; Lubrication systems; Failure diagnostic of tribological systems; Nanotribology. TriboLab realized a great number of projects financed by the Serbian Government or Serbian industry, and 8 international projects (1 EUREKA and 5 bilateral projects, and 2 COST actions). We are also a part of 2 CEEPUS III network. The members of the staff have the cooperation with the universities abroad mainly through the Balkan Tribological Association. TriboLab is one of the founders of the Serbian Tribology Society. Web: http://tribolab.mas.bg.ac.rs/

Fuel and combustion

Fuel and Combustion Laboratory (FCL) is unique in Serbia due to the extensive education and wide research activities comprising: Characterization of fossil and alternative fuels (biomass and biofuels); 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 (EUREKA, FP6, FP7 and H2020 programs), in combustion of lignite, multi-fuel 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, as well as with modern TGA/DSC analyzer coupled with MS analyzer. Besides, FCL has up to date desktop and notebook computers and licensed specialized software (FLUENT, Chemkin, NETZSCH Kinetics Neo)

Tel: +381 11 3370 299
Fax: +381 11 3370 364
E-mail: rprokic@mas.bg.ac.rs
Web site: http://www.mas.bg.ac.rs/organizacija/katedre/23

Full Professors:
Dr Aleksandar Sedmak, Dr Radica Prokić-Cvetković, Dr Dragoslava Stojiljković, Dr Zoran Radaković, Dr Olivera Popović, Dr Aleksandar Vencl.
Associate Professors:
Dr Gordana Bakić, Dr Miloš Đukić, Dr Nebojša Manić, Dr Aleksandar Milivojević
Assistant Professors (Docents):
Dr Vladimir Jovanović.
Teaching and Research Assistants:
Bratislav Rajičić, Nenad Milošević.
Associates
Tijana Popović



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 thermically stressed construction. Finite elements method (FEM) is basic numerical method for structure calculations. Experimental methods of measuring stress are extensio-metric (measuring tape) and photoelastic. 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 success fully cooperated in calculations of various constructions with other Faculty departments, as well as with several distinguished, and regionally well-known companies.

STAFF 6 professors
DATE FOUNDED 1962
DISTINGUISHED ALUMNI
- Prof. Jakov Hlitčijev
- Prof. Dušan Stankov

COOPERATION WITH FOREIGN UNIVERSITIES
- Moscow State University MGU, Russia
- Georgia Tech University, Atlanta, USA
- Technical University of Budapest, Hungary

COOPERATION WITH INDUSTRY
- Lola, HIP Bukulja, Serbian Railways, Termoelektro, TIPO, Belgrade
- Želvoz, Smederevo
- Lafarge cementary, Beočin
- Holcim cementary, Novi Popovac
- Azotara, NISP, HIP, Pančevo

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).

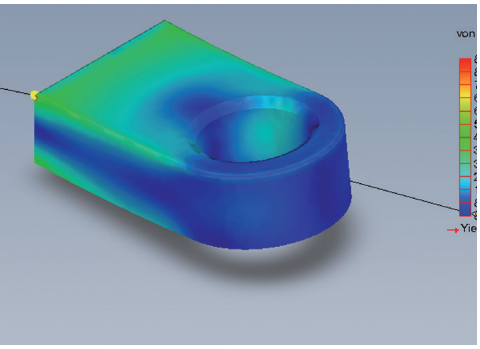
Application Fields:

- 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)

Tel: +381 11 3302 327
Fax: +381 11 3370 364
E-mail: nandjelic@mas.bg.ac.rs
Web site: https://www.mas.bg.ac.rs/organizacija/katedre/24



Full Professors:
Dr. Milorad Milovančević, Dr. Vesna Milošević-Mitić, Dr. Nina Anđelić, Dr. Igor Balać

Associate Professor:
Dr. Vladimir Buljak

Teaching Assistant:
Dr. Ana Petrović

Biomedical Engineering

This is recently founded Department established after twelve years existence of study specialization of Biomedical Engineering (BME). Members of BME Department for many years successfully carries interdisciplinary education (mechanical and electrical engineering, human anatomy and physiology for engineers and design of biomedical instrumentation, devices and clinical equipment). The programme of BME is in line with BME programmes at other European Universities and verified during TEMPUS project.

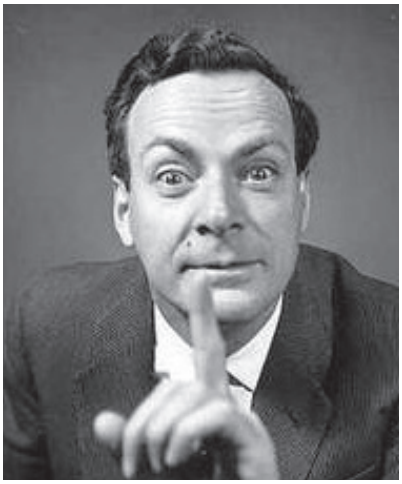
Since 2006, members of BME have been realizing joint research and development with various institutions in the fields:

- Early detection of melanoma, skin cancer, cervical cancer, bowel cancer and oral cavity cancer.
- Medical equipment for clinical use: rotating sick bed and locomotor rehabilitation devices
- Nanophotonic devices for eye protection of UV and high energy blue light, which also regulate secretion of serotonin and melatonin
- Device for vertically transformation of polarized light into hyperpolarized light
- Software and algorithms for Opto-Magnetic Imaging Spectroscopy (OMIS) applied to different types of materials: liquids (solutions), biological tissues and solid state materials.

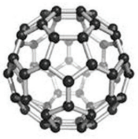
The Department of BME has three teaching and research laboratories : (1) NanoLab - with very sophisticated equipment which could measure properties of samples on nanoscale level by Scanning tunnelling microscopy (STM), Atomic force microscopy (AFM), Magnetic force microscopy (MFM) under different temperature and pressure conditions, (2) SpectraLab - UV/VIS/NIR from 320-3300 nm, FTIR from 2400-14000 nm, and (3) Manufacturing Lab - having different types of tool machine, chemical vapour deposition system, coating system, system for production high pure water (18.2 MΩ) and 3D printers. In NanoLab the first image with atomic resolution of molecule C_{60} was made by STM in April 1992.

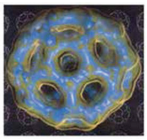
There are two projects with Ministry od education science and technology (III 41006 – Developing method and device for early epithelial cancer detection and III45009 – for development nanophotonic material for contact lenses and glasses), three projects with industry (MySkin, USA, TumourTrace doo and Oraya, USA).

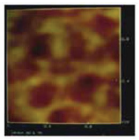
"Engineering without medicine is blind, medicine without engineering is feeble ."



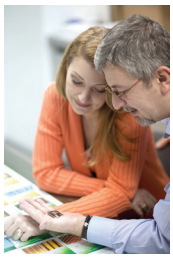
Richard Feynman (1918 -1988) father of idea of Nanoscience and Nanotechnoloy







Left: Stick model of molecule C_{60} (size 1 nm, composed od 60 carbon atoms, rotate 1.8 $\times 10^{10}$ $s^{(-1)}$), **middle**: quantum mechanical model of C60 published on cover page of Science , December 1991, **right**: STM image of C60 done April 1992 at NanoLab



STAFF 2 professors and 1 teaching assistant, 9 researcher assistant and 6 associated professors

DATE FOUNDED

Module 2006 and Department 2018

DISTINGUISHED ALUMNI

- Prof.dr Đuro Koruga, founder of module and first lecturer
- Prof. dr Zoran Krivokapić MD, FRCS, member of SASA

Phone: +381113370384
E-mail: lmatija@mas.bg.ac.rs
Web site: bmi.mas.bg.ac.rs

Full professors:
Dr. Lidija Matija

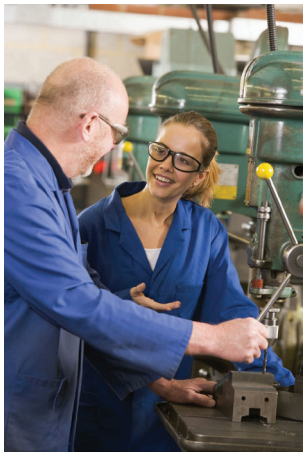
Assistant professors (Dozents):
Dr. Jelena Munćan

Teaching assistant:
Ivana Mileusnić

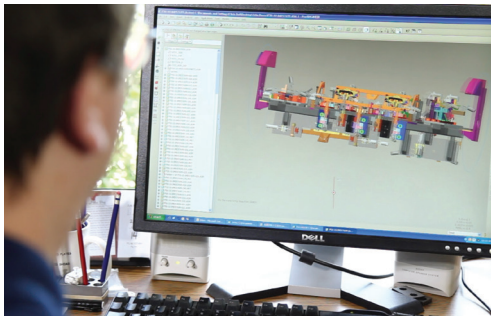
Tim Hunt (Richard Timothy Hunt), British scientist who, with Leland H. Hartwell and Sir Paul M. Nurse, won the Nobel Prize for Physiology or Medicine in 2001 discovering key regulators of the cell cycle, is the only Nobel Prize laureate who visited UB-FME and had discussion with our professors on Sept. 11, 2014.

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 colaboration to University of Belgrade Centre for Career Development (http://www.razvojkarijere.bg.ac.rs/). 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.

Business Technology Incubator

The Business Technology Incubator of Technical Faculties of Belgrade Ltd. (Incubator) was established in 2006 as partnership between four technical faculties of the University of Belgrade (Civil Engineering, Mechanical, Electrical and Technological/Metallurgical), the Municipality of Palilula and the Democratic Transition Initiative. The project was supported by the Organization for Security and Cooperation in Europe based on an international experiences and best practice examples. Objectives of BITF establishment:

- To encourage and support young and educated people in starting up their own business and to keep them in Serbia
- To create the conditions for commercialization of the results obtained through science and research activities of university professors and their associates, by spinning of private enterprises
- To facilitate the creation of new Hi-Tech SMEs

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 in Belgrade, street Ruzveltova 1A.

The BITF has achieved very impressive results for the first 5 years of operation:

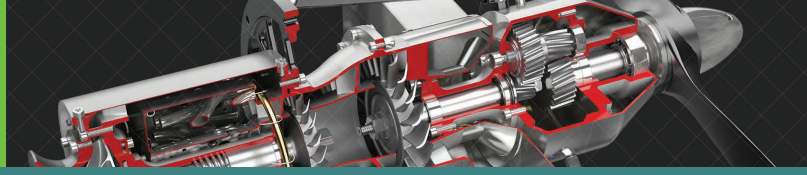
- **600** m2 of renovate business space
- **500** students has passed the trainings on entrepreneurship
- **36** small enterprises tenants of the incubator
- **200** young people engaged in the incubator and enterprises-tenants
- **25** new technologies/services developed in innovation projects
- **3** clusters/networks established
- **1** service center developed (set of legal, accounting and financial services, business plan). Market research services and protection of intellectual property services are currently developing.
- **1** project center developed

Entrepreneurship Certificate appropriation, BITF

www.senergy.rs

www.teleskin.org

Over 70% of income of these companies comes from export. We are particularly proud of the small start-up companies: TeleSkin Ltd., Composite Technology Team Ltd, Elektrosakupljac Ltd. and Vivis Ltd, made and still are being developed by graduate students and professors from Faculty of Mechanical Engineering and some of them are already world-famous.

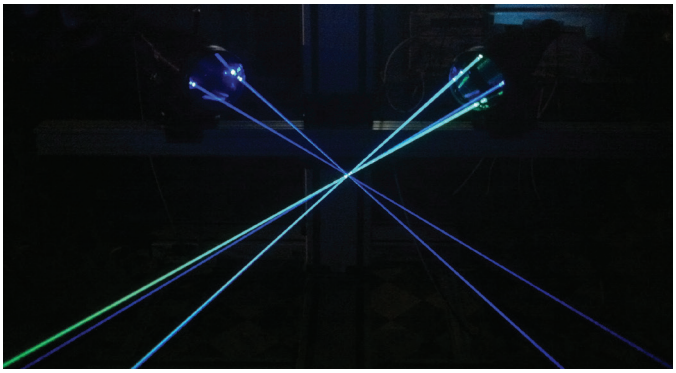


Innovation Centre FME

The major focus of the Innovation Centre at the Faculty of Mecanical Engineering (IC-FME) is on the application of scientific and technological knowledge and inventions and on creation of new and improved products, processes and/or services. Experts and specialists at the Innovation Centre has top-notch equipment, laboratories and other facilities at their disposal which helps them in problem solving for various branches of industry, primarily in the following fields: Light and Heavy (Mechanical engineering) industry, Software design Materials and chemical technologies, IT, Biotechnology, Energy efficiency.

IC-FME facilities and laboratories for applied and innovative research are located in premises at the Faculty of Mechanical Engineering, University of Belgrade.

The activities of IC-FME include various projects, as well as consulting, related to quality control, expertise, certification of products etc.



The Innovation Centre is active participant in European Eureka! projects. In the past the Innovation Centre participated in the following projects:

- E! 3927- MOSTIS "Mobile structure's integrity system",
- E! 4486 HEMIRON - "Research and development of blood derived haemoglobin for animal usage",
- E! 4573 GPMS - "Global Project Management System for Distributed Industrial Companies",
- E! 5348 OLMOST - "On Line Monitoring of Structures and Fatigue",
- E! 5009 GALVAKONT - "The development of the production technology of hot-dip galvanised special transport containers".

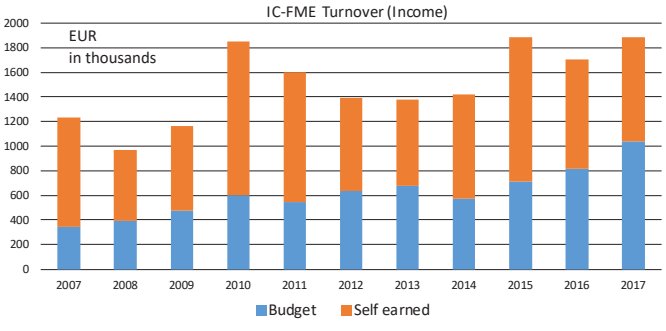
Recently the Innovation Centre takes active participation in the following ongoing Eureka! projects:

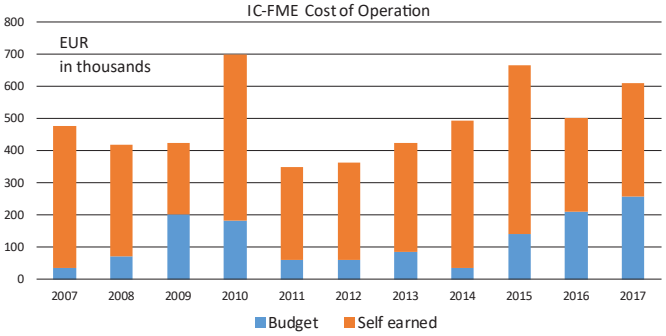
- E! 8029 SEEDO - "A new software for evaluation, optimization and documentation of energy production, transportation and consumption in a community consisting of various housing and industrial objects and other energy users"
- E! 6761 CABIVS - "Development of new generation of crane cabins as integrated visual systems for environmental detection & interpretation".

The Innovation Centre has established bilateral cooperation with research laboratories and similar innovation centers in western Balkan countries.

The Innovation Centre participates in Serbian national technological and innovation projects. The technological development projects guided by Innovation Centre are TR36038 "Development of the method for the production of MEP design and construction documents compatible with BIM process and related standards" and TR35013 "Design and development of hardware and software for connecting personal computers and electronic units in vehicles". The Innovation Centre recently conducted 14 innovation projects: "Development of a methodology to apply new materials for coating cables with adjustable preload force", "Development and design of multiplace hyperbaric chambers for medical applications", "Collection bin for remnants from threshing corn", "Lifting stations bypass filter and heat pump", "The development of the programming language for the 2D parametric geometric molding", "Trailer for shipping, packaging and transporting remnants", "Serbian mini winery", "XYZ nano manipulator", "3D styrodur and polystyrene slicer", "Innovation Relay Centre (IRC) Serbia - Support projected market compatibility and self-positioning as means of improving innovation", "Improving the efficiency of the combustion of biomass development of a new type crusher for briquettes", "A digital system for measuring angular velocity in hydraulic turbines in the system of automatic regulation", "Design and development of a prototype four axis numerically controlled machines for surfacing", and "ICT services to optimize resource consumption".

The Innovation Centre maintains tight relationship with the industry and provides numerous expertises in the fields of pressurized vessels, welding technologies, and structural integrity and lifecycles. Numerous industrial clients benefited from IC-FME expertises, namely Serbian thermal and power plants and all major factories.





Alumni and Friends

Alumni - Echo of the quality and impact

In 2005 UB-FME has established a sprecial enterprise - Foundation of the Faculty, in which Alumni association plays an important role. Several conferences were organized at the Faculty prem-

ises and Serbia-wide and several sections were formed. Prof.Dr. Caslav Mitrovic is leading the collection of valuable data on our Alumni network. More information on activities may be found at: *alumni.mas.bg.ac.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.

Visiting Professors

Prof. Dr.-Ing. Konstantinos-Dionysios Bouzakis
Aristoteles University, Thessaloniki

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

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

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

Prof. Dr. Vojislav Novakovic
Norwegian University of Science and Technology (NTNU Trondheim)

Prof. Dr. Niko Samec
University of Maribor, Slovenia

Prof. Dr.Dusan Sekulic
University of Kentucky, USA

Desimir Jevtić †, Ph.D.
Former Serbian Prime Minister

Dragutin Zelenović, Ph.D.
Former Serbian Prime Minister

Aleksandar Šoštar
Olympic gold medalist
Former Serbian Vice-Minister of Sports

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

Borivoje Mikić, Ph.D.
Professor, Former 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.
Minister for Innovation and Tech.Dev.

Dragan Šutanovac
Former Serbian Minister of Defense

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

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

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

Branislav Grujić
CEO, PSP Farman Holdings, Russia

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

Dragan Đilas
Former Mayor of Belgrade, Serbia

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

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.

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

Alumni of the Faculty - Members of the Serbian Academy of Sciences and Arts (SASA)

Professors - members of SASA

Vladimir V. Farmakovski
8/21.10.1880. - 5.6.1954.
ffp.1920, ret.1945?
Prof. in Railway Eng and Machine Design.
cSASA 1947, full 1948.

Slobodan Dobrosavljević
5.9.1903. - 3.4.1980.
ffp.1937, ret.30.9.1970.
Prof. in IC Engines.
cSASA 1950, full 1961.

Jakov M. Hlitčijev
1.12.1886. - 14.4.1963.
ffp.14.4.1920, ret.30.9.1957.
Prof. in Mechanics and Naval Arch.
full SASA 10.6.1955.

Konstantin Voronjec
17/30.1.1902. - 19.10.1974.
ffp.1947, ret.30.9.1971.
Prof. in Fluid Mechanics.
cSASA 30.1.1958, full 5.12.1963.

Miroslav Nenadović
18.3.1904. - 21.2.1989.
ffp.1937, ret.30.9.1974.
Prof. in Aeronautical Eng.
cSASA 30.1.1958, full 16.12.1965.

Dimitrije Savić
29.9.1898. - 16.4.1981.
ffp.1960, ret.1966.
Prof. in Thermal Power Eng.
cSASA 17.12.1959, full 7.3.1968

Nikola Obradović
15.5.1900. - 7.12.1982
ffp.1924, ret.30.9.1970.
Prof. in Hydro Power Eng.
cSASA 1961, full 1972.

Svetopolk Pivko
29.9.1910. - 13.10.1987.
ffp.1964, ret.30.9.1978.
Prof. in Mechanics.
cSASA 22.12.1961, full 1976.

Dušan Veličković
1.2.1909. - 8.10.1971.
ffp.1946, died before retirement.
Prof. in Fuels and Combustion.
cSASA 1963.

Petar Miljanić
17.8.1927. - 16.2.2015.
ffp.1957, ret.30.9.1992.
Prof. in Electical Eng.
cSASA 1968, full 1976.

SASA
cSASA - corresponding member
full - full member

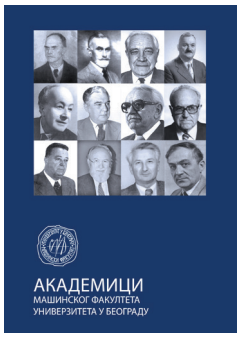
UB-FME
ffp. - first faculty position
ret. - retirement

Nenad Zrnić
28.01.1909. - 20.2.1991.
ffp.1949, ret.30.9.1978.
Prof. in Naval Arch.
cSASA 1972, full 1985.

Miomir Vukobratović
26.12.1931. - 11.3.2012.
ffp.1984, ret.30.9.1996.
Prof. in Robotics.
cSASA 7.5.1981, full 27.10.1994.

САНУ
СРПСКА АКАДЕМИЈА НАУКА И УМЕТНОСТИ

Vladan Đorđević
7.10.1938. -
ffp.1962, ret.30.9.2004.
Prof. in Fluid Mechanics.
cSASA 12.12.1985, full 23.10.1997.



Professor of Grand Technical School

Ljubomir Klerić (Julius Klery)
29.6.1844. - 21.1/3.2.1910.
Prof. in Mechanics since 1875.
Since 24.1.1871. member of Serbian Learned Society (1864 - 1892) and since 5.4.1887. member of Serbian Royal Academy (1886 - 1947)

UB-FME Graduate students - members of SASA

Professors at other universities

Dragutin Zelenović, 19.5.1928 - , cSASA 29.5.1991, Uni. Novi Sad
Miloš Kojić, 24.12.1941 - , cSASA 2009, full 8.11.2018, Uni. Kragujevac
Milorad Bojić, 4.1.1951 - 22.1.2016, cSASA 2015, Uni Kragujevac

Research - International Projects and Journal

Horizon 2020
Flexible Fossil Power Plants for the Future Energy Market through New and Advanced Turbine Technologies (FLEXTURBINE)
Novel and Improved Maritime Transport Concepts (NOVIMAR)
Demonstration of Innovative Integrated Biomass Logistics Centres for the Agro-Industry Sector in Europe (AgroInLog)
The Energy Data Innovation Network; Using Smart Meter Data, Campaigns and Networking to Increase the Capacity of Public Authorities to Implement Sustainable Energy Policy (Edi-Net)
Seventh Framework Programme, FP7
Delivery of Sustainable Supply of Non-Food Biomass to Support a "Resource-Efficient" Bioeconomy in Europe (S2BIOM)
Modernisation of Vessels for Inland Waterway Freight Transport (Move It!)
Efficient Use of Resources in Energy Converting Applications (EURECA)
Bilateral cooperation
Design Aad Evaluation of User Interfaces for Distance Collaborative Management of Production Systems (State?)
Investigation of the Turbulent Structure Behind the Axial Fan Impellers by Use of the HWA, LDA and PIV Measuring Techniques and CFD Analysis (Germany)
Computational and Experimental Investigation of the Airflow in the Human Nasal Cavity (PIVNAS), (Germany)
Investigation of the Influence of Turbulent Swirl Flow on the Energy Parameters of the Axial Fans by Use of the Contemporary Measurement Techniques (AXMES), (Montenegro)
Smart Eco-Friendly Nanostructures and Nanocomposites (Project No 4510339/2016/09/13) (France)
Enabling Web-Based Remote Laboratory Community and Infrastructure (EWBRLCI) - SCOPES, (Switzerland)
Joint Reseach on the Development Tehnology of Low-Head Run-of-the-River Hydropower (China)
Human-Robot Co-Working as a Key Enabling Technology for the Factories of Future (Pgr02921), (Italy)
Quality Improvement of Master Programs in Sustainable Energy and Environment (QIMSEE), (Norway)
Sustainable Energy And Environment In The Western Balkans (Seewb)
Difference Equations And Constructive Approximation: Theory And Applications (Decata), (Spain)
Numerical and experimental research of rolling bearings dynamic behaviour in order to improve the service life, reliability and energy efficiency of technical systems (Montenegro)
Influence of stochastic loading conditions on construction's fatigue estimation with application (China)
Research on the state of gear teeth surface made from 3D printing at low load operation (Slovake)
EU strategy for the Danube region - Interreg Transnational Programme
Innovative Danube Vessel
Smart Building – Smart Grid – Smart City (Dtp1-502-3.2 3smart)
TEMPUS - ERASMUS+
Knowledge Triangle In Serbia (KNOWTS)
Governance And Management Reform In Higher Education In Serbia (GOMES)
International Accreditation Of Engineering Studies (IAES)
Human-Tool Interaction Network (HUTON)
Inplementation of Dual Education in Higer Education of Serbia (Dual Edu)
Improvement of product development studies in Serbia and Bosnia and Herzegovina (IPROD)

Eureka
Development Of New Generation Of Crane Cabins As Integrated Visual Systems For Environmental Detection & Interpretation (Cabivs)
Sustainable Materials And Products From Poultry Feather Wastes Feval (Feval)
Ceepus
Contemporary Manufacturing And Measuring Technologies In Quality Management Systems
Modern Trends In Education And Research On Mechanical Systems – Bridging Reliability, Quality And Tribology
Development of mechanical engineering (design, technology and production management) as an essential base for progress in the area of small and medium companies' logistics - research, preparation and implementation of joint programs of study
Computer Aided Design of automated systems for assembling
Technical Characteristics Researching of Modern Products in Machine Industry (Machine Design, Fluid Technics and Calculations) with the Purpose of Improvement Their Market Characteristics and Better Placement on the Market
Cei-kep
Capacity Building For Improved Mineral Fuels Monitoring System – Transfer Of Best Practices Against Grey Economy (Fuelpage)
Cip-ict-psp [ict for energy and water eficiency in social housing]
Balanced European Conservation Approach – Ict Services For Resource Saving In Social Housing (Beca)
Cip-Pilot actions
Saving Energy In Europe's Public Buildings Using Ict (Smartspaces)
COST
Understanding And Controlling Nano And Mesoscale Friction
Safera Era NET
Smart Process Industry Cranes (Sprince)
Industry
Performance Guarantee Test On Ip Turbine In Tpp Nikola Tesla B2
Fine Optimization Of The Flow Path Of A 14 Stage Steam Turbine And Optimization Of The Stacking Of The Last 3 Stages
3d Calculation Of Flow Through A Single Blade Row Including Labyrinth Seals
Flow Analysis And Performance Calculation Of A New Siemens Gas Turbine
Aerodynamic Calculation Of Siemens Gas Turbine Sgt4000f
Performance Test Concerning Ip Turbine Efficiency In Te Morava
European Bank for Reconstruction and Development (EBRD)
C33260/Cei2-2015-11-17 For Serbia: Innovation Vouchers Scheme For Resource Efficiency Technologies And Services: Programme Preparation And Definition Of Possible Implementation Approaches (Tcrs 1654)
Innovation Vouchers Scheme For Resource Efficiency Technologies And Services In Serbia - Support To The Implementation And Marketing Of The Innovation Vouchers Scheme In The Country (Ref. No. 1206.001-17)
United Nations Development (UNDP) and Enviroment (UNEP) Programe
Second National Communication to the UNFCCC for Serbia and Serbia's First Biennial Update Report (SNC-FBUR)
Global Market Transformation for Efficient Lighting (En.Lighten Initiative)
Innovative Uses Of Low-Temperature Geothermal Resources In South East Europe (Geosee) - South East Europe Transational cooperation Programme
Experimental Determination Of The Wear Mechanisms At The Nano And Macroscale – Bridging The Gap Between Two Scales

Organizational Structure

- Faculty Council with its President;
- Dean;
- Vice-deans for: studies; finances; science and research; international cooperation;
- Heads of chairs - 25 Chairs;
- Heads of laboratories - 90 laboratories, 5 laboratories accredited by The Accreditation Agency of Serbia;
- Secretary General, Head of Finances, Head of Student Services, Head of Library, etc.;
- Administrative units for students, finances, building maintenance, etc.;
- Library with over 100,000 items;
- Publishing service.

Staff (as of Oct. 2018)

- Full professors 81
- Associate professors 39
- Assistant professors (Dozents) 37
- T&R Assistants 44
- Researchers 29 + 12 + 78 = 119
- Lab and technical personnel 34
- Administrative personnel 50
- Technical and cleaning service 59
- Restaurant 9

Number of alumni

1. Dipl.Ing. (5 years of study): 19,964 (Oct.1948 - Sept.2018)
2. Magisters (Mgr.) (2 additional years of study with thesis): 1,483 (Oct.1948 - Sept.2018)
3. Doctorates (just defense of thesis): 948 (Oct.1948 - Sept.2018)

.....

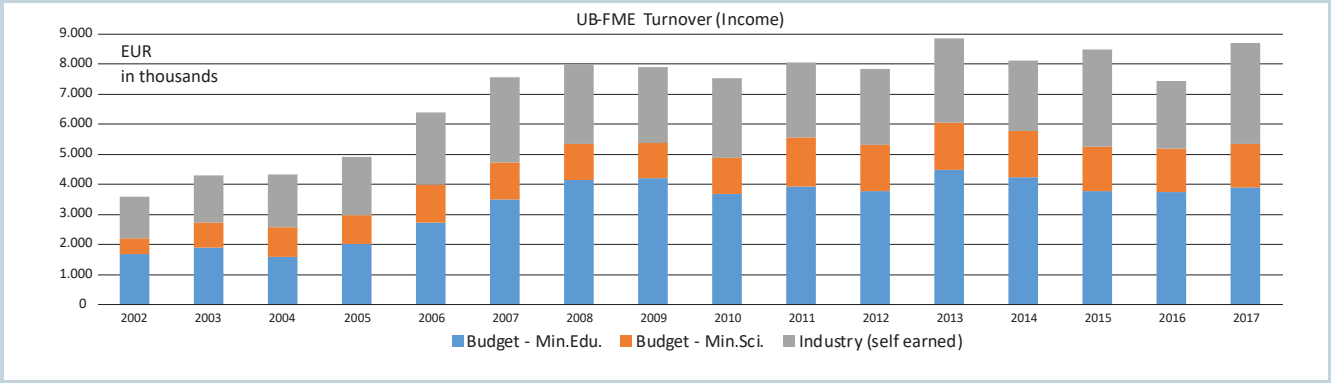
4. Bachelors of Science: 2779 (Oct.2006 - Sept.2018)
5. Masters of Science (Dipl.Ing.): 1578 (Oct.2006 - Sept.2018)
6. PhDs through studies: 130 (Oct.2006 - Sept.2018)

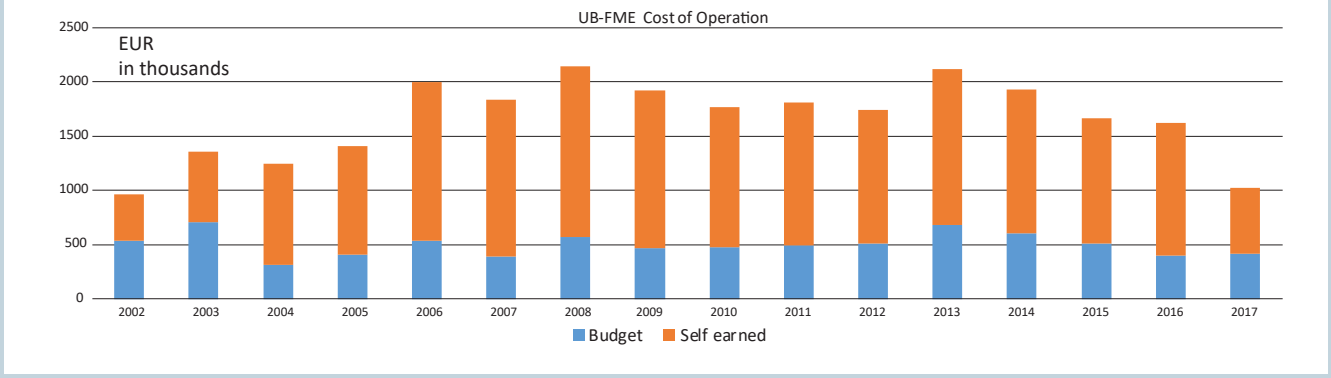
Buildings

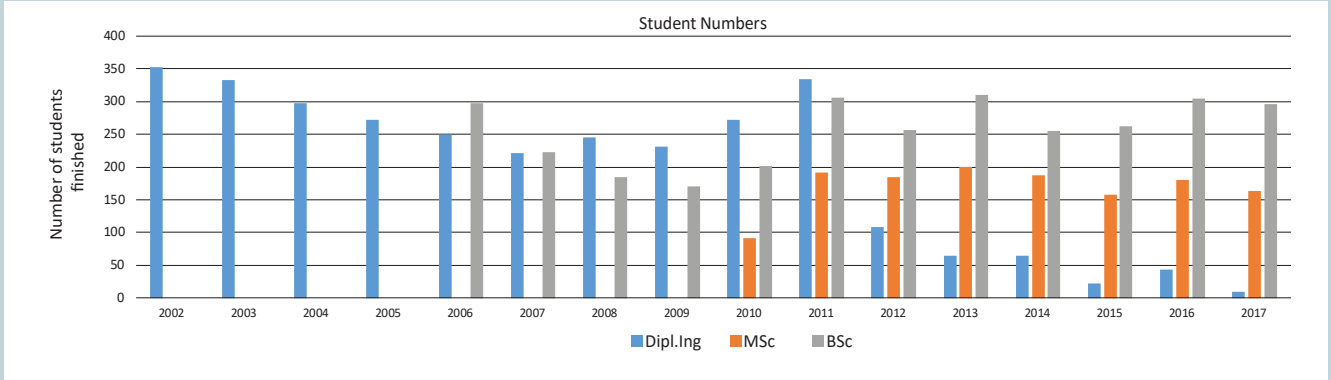
- New building 32,239 m2
- Old building 4,115 m2
- Wind tunnel building 516m2
- Building of a former heating plant 1,303 m^2

Altogether 38,173 m^2

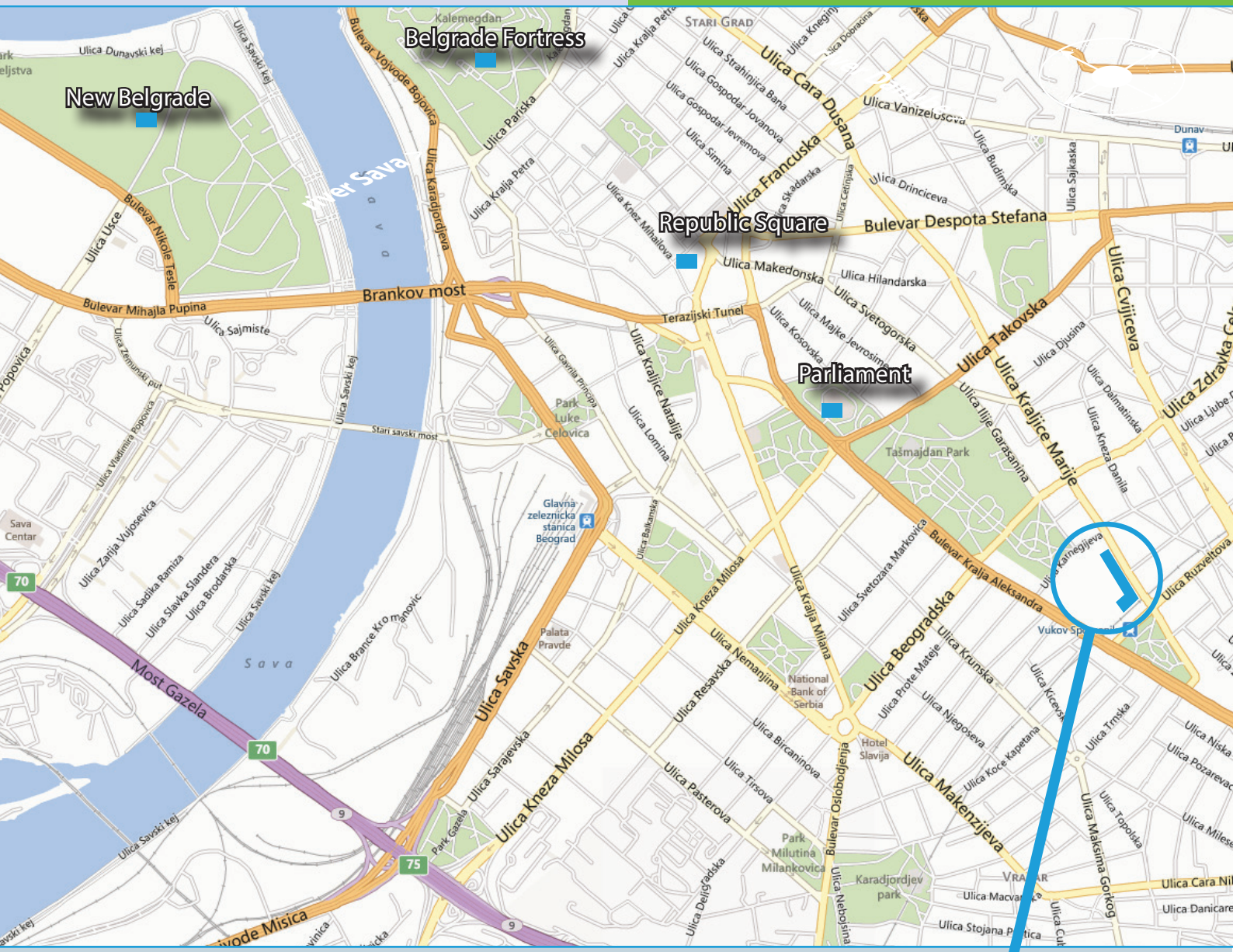
- 4 amphitheatres
- 30 lecture rooms
- 4 rooms for numerical laboratories
- 1 specialized IT room
- 30 laboratories
- 1 ceremonial room
- 4 conference rooms
- 118 offices
- 2 library reading rooms
- 2 internet alleys with free WiFi access
- student caffe, caffeteria with bakery, restaurant







After passing of the accreditation procedure 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.



Wind tunnel building

Faculty old building

Faculty building

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

The easiest way to get to the Faculty building from Belgrade Bus Station is to take tram no.2, no.7 or no.12, direction Bulevar Kralja Aleksandra.

TRAIN

The easiest way to get to the Faculty building from Belgrade Train Station is to take tram no.2, no.7 or no.12, direction Bulevar Kralja Aleksandra.

PLANE

The easiest way is to take a taxi. Other options are:

1. to take a mini bus A1 to Slavija square which goes every 20 minutes, and then take tram no.2 or no.12 direction to Bulevar Kralja Aleksandra;
2. to take public transport bus no.72 to Zeleni venac and after that bus no.65 to the Faculty location.

http://www.beg.aero/passengers/to_and_from_the_airport/bus_transport.326.html

Mechanical Engineering @ University of Belgrade

Editor and Text Coauthor: Prof.Dr. Miloš Nedeljković
Design, Text Coauthors and DTP: Miloš Batrićević
Marko Cvijić
Vladica Zdravković, Aleksandar Jašarević

Coauthors of the texts on study specializations and departments are members of the departments.
Photographs of the staffs of departmants: Prof. Dr. Zoran Stamenić.

Publisher:
University of Belgrade, Faculty of Mechanical Engineering
Kraljice Marije 16
11120 Belgrade 35, Serbia
Tel: +381.11.3302384, 3302382, 3302249, 3302200
Fax: +381.11.3370364, 3302251
Web: www.mas.bg.ac.rs
E-mail: mf@mas.bg.ac.rs; dekan@mas.bg.ac.rs
For publisher: Dean Prof.Dr. Radivoje Mitrović
Some photos are royalte free from sxc.hu & flickr.com
Aerial views of Belgrade are courtesy of Google Inc.

Print:
PLANETA print
Igora Vasiljeva 33r
11000 Belgrade
Tel / Fax: +381.11.6506564

CIP - Каталогизација у публикацији
Народна библиотека Србије, Београд
378.6:621(497.11) "1948/2018"
MAŠINSKI fakultet (Beograd)
Mechanical Engineering @ University of Belgrade / [editor Miloš Nedeljković]. - 3. izd. - Belgrade : Faculty of Mechanical Engineering, 2018 (Belgrade : Planeta print). - 78 str. : ilustr. ; 30 cm
Kor. nasl. - Tiraž 1.500. - Str. 3: Deans Through 70 Years of the Faculty History / Radivoje Mitrović.
ISBN 978-86-7083-995-3
a) Машински факултет (Београд) - 1948-2018
COBISS.SR-ID 270994956

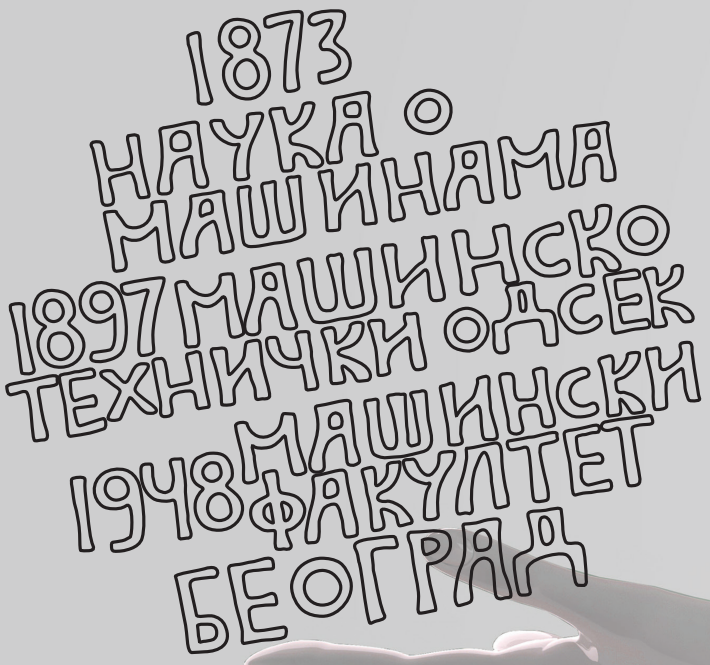
Circulation: 1500 copies
Free publication, Version 3 – 11/2018

SERBIAN EMBLEM OF ARMISTICE DAY (November 11th)

Natalie's ramonda (Lat. Ramonda nathaliae) – a species of flowering plant in the genus Ramonda that grows in eastern part of Serbia, scientifically described in 1884 by Royal MD Sava Petrovic and Academician Jovan Cvijic, who named it after Queen Natalija Obrenovic, which besides its beauty of the purple leaves, has a magical Fenix ability to return to life from hibernation with a few drops of water, thus symbolizing resurrection of Serbian army and state during the WW I.

Strip (band) of the Serbian medal awarded to military personnel and civilians who retreated through Albania to Corfu island in Greece and back to Salonika frontier, instead the medal the strip holds ramonda in the emblem of Armistice Day.

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



ISBN 978-86-7083-995-3

www.mas.bg.ac.rs