



Silesian
University
of Technology



RESEARCH
UNIVERSITY
EXCELLENCE INITIATIVE



Faculty of
Biomedical Engineering



SPREAD YOUR
WINGS WITH US!

INFORMATION FOR CANDIDATES FOR STUDIES AT
THE FACULTY OF **BIOMEDICAL ENGINEERING**

Dear Secondary School Graduates!

You are now faced with a very important life choice, upon which your future will depend. **This is, undoubtedly, a difficult moment for every secondary school graduate.** Therefore, try to make wise and thoughtful choices, so that in the future your professional activity will enable you to pursue your passions and interests. I hope that this guide will help you make this difficult decision, and at the same time encourage you to undertake studies at the **Faculty of Biomedical Engineering of the Silesian University of Technology.**

Our University is the oldest technical university in Silesia, with a long-standing, over 75 year-old tradition. We prioritise innovation and continued development. The Silesian University of Technology is the only university in Silesia to be included in the prestigious group of 10 Polish universities, winners of the **Initiative of Excellence competition - in the Research University category**, awarded by the Ministry of Science and Higher Education. This has paved the way for an additional chance for development, and you can become part of it. On the flipside, the Faculty of Biomedical Engineering is the youngest of our universities and it is already well-recognised, not only in Poland but also overseas. It is the only such faculty in Poland. Our educational offer includes majoring in Biomedical Engineering, both in the Polish and in the English language. This field of expertise is one of the fastest growing, especially in technologically-advanced countries. Studies in this field are a response to a high demand for specialised engineering staff. That should contribute to the establishment of new companies manufacturing products and materials to cater for the needs of medicine and, consequently, the implementation of innovative technologies and medical devices in health care units. Further development of our department will be carried out based on the appointed centre called EHTIC (**European HealthTech Innovation Centre**). It is a group of specialised laboratories integrated with facilities at the Faculty of Biomedical Engineering. It was created as a result of the project implementation, together with its strategic partner - Philips.



Zbigniew Paszenda, BEng, PhD, DSc, ProfTit
Dean of the Faculty of Biomedical Engineering

The Faculty of Biomedical Engineering has well-qualified research and teaching staff, as well as modern laboratories supplied with state-of-the-art equipment. This ensures a high-level implementation of the teaching process and applying **modern forms of education**. We are a Faculty that comprehensively supports its students and helps them develop their passions and interests. They have the opportunity to develop their interests in various areas of biomedical engineering by engaging in the activities of student scientific circles. Thanks to the cooperation we have established, our students also have the opportunity to complete some of their studies at foreign universities. We also collaborate with many health care units, as well as companies constituting the technical facilities of medicine. As a result, our students have a chance to gain valuable professional experience.

Third level education is not synonymous only with studying. We also create a good atmosphere for the broadly-understood college life, with excellent sports and cultural facilities at our University. **Join our academic community at the Faculty of Biomedical Engineering. It's a group of people passionate for learning, which helps them spread their wings.**

Zbigniew Paszenda, BEng, PhD, DSc, ProfTit

Dean of the Faculty of Biomedical Engineering
of the Silesian University of Technology

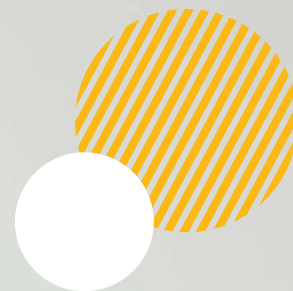
**„...To be satisfied with oneself
is the greatest happiness...”**

Thomas Mann

You don't know if the Faculty of Biomedical Engineering is for you?

Visit our website to get to know us better!

ib.polsl.pl



How to join us?

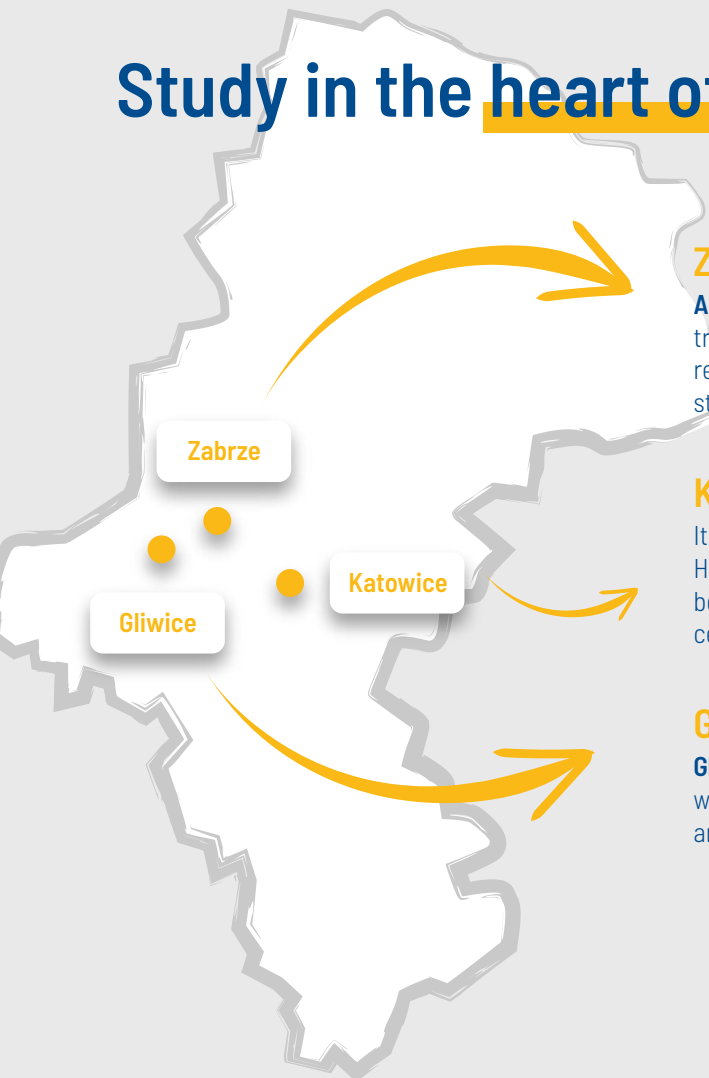
Visit our recruitment page of the Silesian University of Technology

You will find there only the latest information!

apply.polsl.pl



Study in the heart of Silesia



ZABRZE - *this is where we have our campus!*

A city in the heart of Silesia. Zabrze combines industrial tradition with an innovative approach. Thanks to recognized research centers, the city takes pride in having a specialized staff that takes on ambitious scientific and medical challenges.

KATOWICE

It is the **largest city in Silesia** with over 300,000 residents. Historically associated with mining and metallurgy, it is now becoming a thriving economic, cultural and entertainment center.

GLIWICE

Gliwice is a city with over 760 years of history. Once associated with heavy industry, today it bases its dynamic development on an innovative economy.

The location in the central part of Upper Silesia guarantees excellent communication with many cities!

move around :)



by bus

Zabrze-Gliwice line number 32 or 932

Katowice-Gliwice (through Zabrze) line number 6, 840, M1 and M2



by train

Silesian Railways

Katowice-Gliwice Line (through Zabrze)



by car

DTŚ road, A1 and A4 motorways, national road number 88

From student life

some practical information

DORMS

Did you know that the Silesian University of Technology has as many as 13 dorms?

There are **11 of them at the Campus in Gliwice**, and the other two are located in **Zabrze** and **Katowice**. Each of the dormitories has its own name – **the one in Zabrze is called Alaska**. The campus is not only dormitories, in the close neighbourhood you can find: a student clinic, a library, a student canteen, "Orlik Studencki" sports fields, a Sports and Recreation Center and an Mrowisko (Anthill).

STUDENT CLINIC

The health clinic is adjacent to the university campus. Equipped with modern medical offices, offers access to specialist doctors from Monday to Friday, it is located at **5 Łużycka Street in Gliwice**.

LIBRARY

Our Library is a place where you can find the necessary materials for classes, use the computer, and even eat something good at the buffet. The library is located at the Campus in Gliwice at **23 Kaszubska Street**.

SPORT

Do you want to develop your skills?

Maybe you will find something for yourself at the **Sports and Recreation Center of the Silesian University of Technology in Gliwice**. In the offer of the Center you will find various sports facilities, among others halls with volleyball and basketball courts, gyms, judo and aerobics rooms, table tennis rooms and an ice rink.

ACADEMIC THEATER

We do have one, are you surprised?

We have much more, check out Mrowisko. The facility is indeed an anthill of culture in which everyone will find a suitable space for self-realization. There you will also find the University Board of Student Government. Look for two ants on **85 Pszczyńska Street in Gliwice**.

Our campus



House of Music and Dance **8 min**
Fallen Heroes Park **12 min**
Railway station **15 min**

Faculty of Organization and Management

Faculty of Biomedical Engineering
building E, auditorium

Faculty of Biomedical Engineering
the main building

European HealthTech
Innovation Center

Parking for students **10 min**
Stadium Ernest Pohl **10 min**
City Botanical Gardens **15 min**

Zabrze FlixBus stop **15 min**
Guido Coal Mine **22 min**

- ATMs
 - shops
 - pharmacy
 - food services
 - photocopying points
 - bus stop
- Zabrze Politechnika Śląska

8

Approximate times are for pedestrian traffic

Our buildings



Faculty of Biomedical Engineering
the main building

European HealthTech
Innovation Center



Faculty of Biomedical Engineering
building E

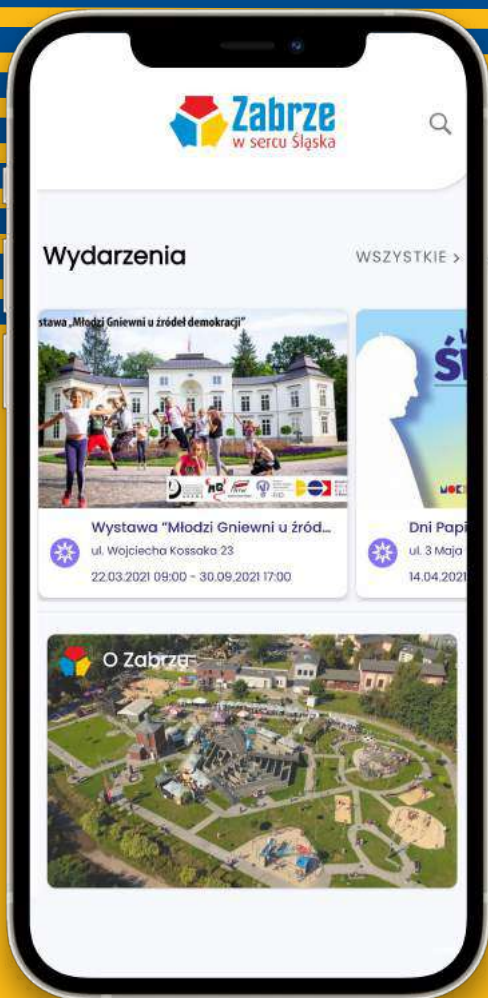


Checklist of places you must visit!

You must visit!

- Guido Coal Mine
- Zabrze Philharmonic
- Stadium Ernest Pohl
- Fallen Heroes Park
- House of Music and Dance
- Maciej Shaft
- City Botanical Gardens
- Military Technique Park

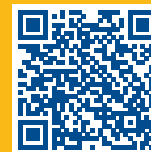




Do you want to **discover**
more in Zabrze?

*Check out the official Zabrze
mobile application!*

for now only in Polish



High quality of education

Studies at the **Faculty of Biomedical Engineering** allow you to gain valuable professional experience through the possibility of internships in companies and institutions. In addition, the program of regular meetings with industry representatives **Wednesday with Industry** organized by the Faculty will allow you to gain the necessary knowledge on how to enter the professional market.

The Faculty of Biomedical Engineering, as an interdisciplinary unit, has the **opportunity to conduct research projects in as many as three of the six priority research areas** funded under the "Excellence Initiative - Research University" program.



studies in Polish and English



modern research laboratories



professional and student-friendly research and teaching staff



still expanding didactic and research infrastructure

Let the numbers speak for themselves

over 300

students currently studying



over 1 000

faculty alumni



over 40

PhD students



over 80

research and teaching staff



4

student academic clubs



over 10 years

since the founding of the faculty



over 150

agreements with industry entities



over 130

research papers



Faculty units

four directions of development



Department of Medical Informatics and Artificial Intelligence

head of the department: Ewa Piętka, BEng, PhD, DSc, ProfTit



Department of Biomaterials and Medical Device Engineering

head of the department: Zbigniew Paszenda, BEng, PhD, DSc, ProfTit



Department of Biomechanics

head of the department: Marek Gzik, BEng, PhD, DSc, ProfTit



How looks the path of education at our Faculty?

Bachelor level

duration of study: 7 semesters, 3.5 years,

choice of educational path: after the 2nd semester of studies,

possible educational paths:

- Medical Informatics and Artificial Intelligence
- Biomaterials and Technologies for Medicine
- Design of Biomechatronics Devices
- Electronics and Biomedical Informatics

Master level

duration of study: 3 semesters, 1.5 years,

possible specialties:

- Medical Informatics (in Polish and English)
- Manufacturing Engineering of Implants, Hospital and Rehabilitation Equipment (in Polish)
- Biomechatronics and Medical Equipment (in Polish)

First-cycle studies – Bachelor level



*Semester
1-2*

general education: no choice of educational path

*Semester
3-7*

education at one of the educational paths:

- Medical Informatics and Artificial Intelligence
- Biomaterials and Technologies for Medicine
- Design of Biomechatronics Devices
- Electronics and Biomedical Informatics

First-cycle studies - Graduate's skills

Medical Informatics and Artificial Intelligence

- You will learn the principles of acquisition of signals, images, and other medical data.
- You will learn the most recent techniques of biomedical information processing and analysis.
- You will know and understand what artificial intelligence, machine learning, or deep learning are, and how they support medicine.
- You will specialize in computer programming, medical informatics, and hospital information systems.

Biomaterials and Technologies for Medicine

- You will gain knowledge in the field of materials for medicine, including biomaterials and dental prosthetics as well as methods of modifying their surface with the use of modern technologies of shaping surface layers and coatings.
- You will learn how to design and manufacture medical devices, in particular personalized implants and modern implantation systems and surgical instruments, including the medical sterilization process for the needs of medicine of the future.
- You will learn about techniques and technologies, as well as methods of manufacturing ready-made medical devices and you will gain skills regarding the implementation and registration of medical devices.

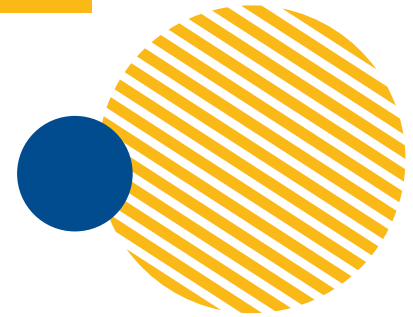
Design of Biomechatronic Devices

- You will learn and become familiar with interdisciplinary issues from various fields such as biomechanics, electronics, mechanics, sport and rehabilitation engineering.
- You will gain knowledge and skills in designing and computer simulations with the use of modern CAD and CAE systems and the implementation of advanced biomechatronic systems, especially in the field of medicine and sports.
- You will learn and acquire the skills of inventing, constructing and delivering engineering solutions related to rehabilitation and sport with the use of modern technologies such as virtual reality and robotics.

Electronics and Biomedical Informatics

- You will learn the construction and functioning of the basic elements of active medical devices and learn to design and program electronic biomedical systems.
- You will gain knowledge both in the field of high- and low-level programming and in designing the architecture of embedded systems, including the biomedical Internet of Things – IoT.
- You will learn the methodology of acquiring and processing biomedical signals and images, which are essential in diagnostics, and the modeling of biomedical systems.
- You will learn modern trends in biomedical data analysis, including machine learning methods and artificial intelligence algorithms.

Second-cycle studies - Master level



Semester
1 - 3

education at one of the specializations:

- Medical Informatics (in Polish and English)
- Manufacturing Engineering of Implants, Hospital and Rehabilitation Equipment (in Polish)
- Biomechatronics and Medical Equipment (in Polish)

Second-cycle studies - Graduate's skills

Medical Informatics

- You will know advanced diagnostic and therapeutic techniques and learn how computer science can help the doctor.
- You will learn to process large amounts of data using machine learning tools and artificial intelligence.
- You will be able to use machine learning and artificial intelligence in medical matters.
- You will learn the latest standards for the design and implementation of IT medical systems.
- You will learn to work in diverse technological stacks.
- You will stand out from programmers who graduate from classical computer science with the knowledge of the specifics of the medical industry.

You will be able to work as a:



Medical Data Scientist



Telemedicine systems designer



Mobile and web application developer



IT medical systems administrator



Medical systems business analyst



Universities and research institutes employee

Second-cycle studies - Graduate's skills

Manufacturing Engineering of Implants, Hospital and Rehabilitation Equipment

- You will learn the secrets of designing implants, hospital and rehabilitation equipment using intelligent materials for medicine.
- You will learn how to manufacture the final medical product using modern manufacturing techniques based on your own concept designed in CAD software.
- You will master the skills of implementing and registering a medical device, taking into account the guidelines of the European Commission and normative recommendations.
- You will solve complex practical problems by planning research, analyzing the obtained results, and formulating substantive conclusions based on them.
- You will learn to apply theoretical knowledge in practice.

You will be able to work as a:



Materials for medicine engineer



Certification of medical devices specialist



Implant design engineer



CAD designer



Medical devices production engineer



Universities and research institutes employee

Second-cycle studies - Graduate's skills

Biomechanics and Medical Equipment

- You will master the secrets of CAD design, thanks to which you will design rehabilitation or sports equipment.
- You will learn to use the Madymo software, where you will simulate car accidents and evaluate their consequences in terms of human safety.
- You will plan a series of studies that will allow you to support sports training and learn to use virtual reality during rehabilitation and sports training.
- You will learn to design intelligent devices.
- You will learn about the biomechanical system of human movement and the impact of implants on human bone structures.
- You will be trained in the field of human body movement analysis using modern technology.

You will be able to work as a:



CAD designer



Dynamic simulation engineer



Rehabilitation and sport biomechanical engineer



Smart devices designer



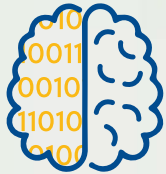
Biomechatronic engineer



Universities and research institutes employee

Student scientific clubs

expand your passions!



BIOSOFT

Are you interested in **programming, AI or Robotics**? Come to us - together we will create the future!



SYNERGIA

Research on biomaterials, CAD certificates, your ideal scientific publications - it's possible thanks to the activity in our club!



BIODREARYWNI

The most active scientific club at the Faculty*. Only with us the most interesting projects and the opportunity to be a real scientist!



We increase your competences in the field of **medical technologies!**



What else do you gain

by studying at our Faculty?



- some of the classes are conducted in a **block system**, thanks to which the examination session becomes easier and less strenuous,
- you can **carry out your diploma thesis** in modern, well-equipped laboratories of the **European HealthTech Innovations Center (EHTIC)**, which was established as part of a project with PHILIPS,
- Your engineering or master's thesis has a chance to win in the **annual competition for diploma theses under the patronage of IEEE**,
- you can take part in a wide range of **PBL and POWER projects** (details on page 26) or projects organized by the Silesian University of Technology,
- you have the opportunity to **participate in foreign exchange programs or take advantage of many scholarship offers** at the Silesian University of Technology (including DAAD - German Academic Exchange Center, Polish-American FULBRIGHT Commission, French Government scholarships, Swiss-Polish Cooperation Program (SCIEX)).

Project Based Learning - PBL

what is it about?

Students learn through the **implementation of projects lasting from several to several weeks**, during which they **develop substantive knowledge, practical skills and critical thinking**. They also become co-authors of conference presentations and scientific publications. Implementation of projects releases **creative energy among students and academic teachers**, **teaches teamwork in interdisciplinary groups**, often in contact with a partner from industry or from a foreign research unit.



teamwork



knowledge and skills



creative energy



cooperation with the industry



conference presentations
and scientific publications

Cooperation with industry and research centres

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FUNDACJA ROZWOJU KARDIOCHIRURGII
im. prof. Zbigniewa Religi

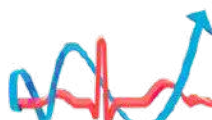


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Profesjonalna Aparatura Medyczna

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CENTRUM
LECZENIA
OPARZEŃ
im. dr Stanisława Sakiela
w Slemianowicach Śląskich



**Narodowy
Instytut
Onkologii**



im. Marii Skłodowskiej-Curie
Państwowy Instytut Badawczy
Oddział w Gliwicach

**Cedars
Sinai**

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University of Technology

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BetaMed
CENTRUM KARDIOLOGICZNE



ŚLĄSKIE CENTRUM
CHOROÓB SERCA W ZABRZU

WAT Wojskowa
Akademia
Techniczna

Technomex

**UNIVERSITÄT
SIEGEN**

**American
Heart
of Poland**



Scholarships and Aid

Chancellor's Scholarship

is awarded to the best students. They can be awarded to a student with a very good academic record, who also demonstrates scientific, artistic or sports achievements.

Social scholarship

it may be granted to a student in a difficult financial situation. **The basis for its award is the income of the student's family members.** The scholarship may be obtained by a student from the first year of studies. Its amount may be increased for living outside the home.

Scholarships for people with disabilities

a student may receive a **disability confirmed** by a decision of a competent authority.

Grant

may be granted to a student who finds himself in a difficult financial situation. You can apply for it twice in a given academic year.



After studying ideas

*what career path
suits you?*

*here you can
find the answer!*

Are you looking for a job?

Check up in the Student Career Office

Ready to install a StartUp?

Audit workshops at the Technopark

Are you dreaming about a scientific career?

Sustain studying at Joint Doctoral School

Are you seeking to develop your knowledge?

Verify our postgraduate courses

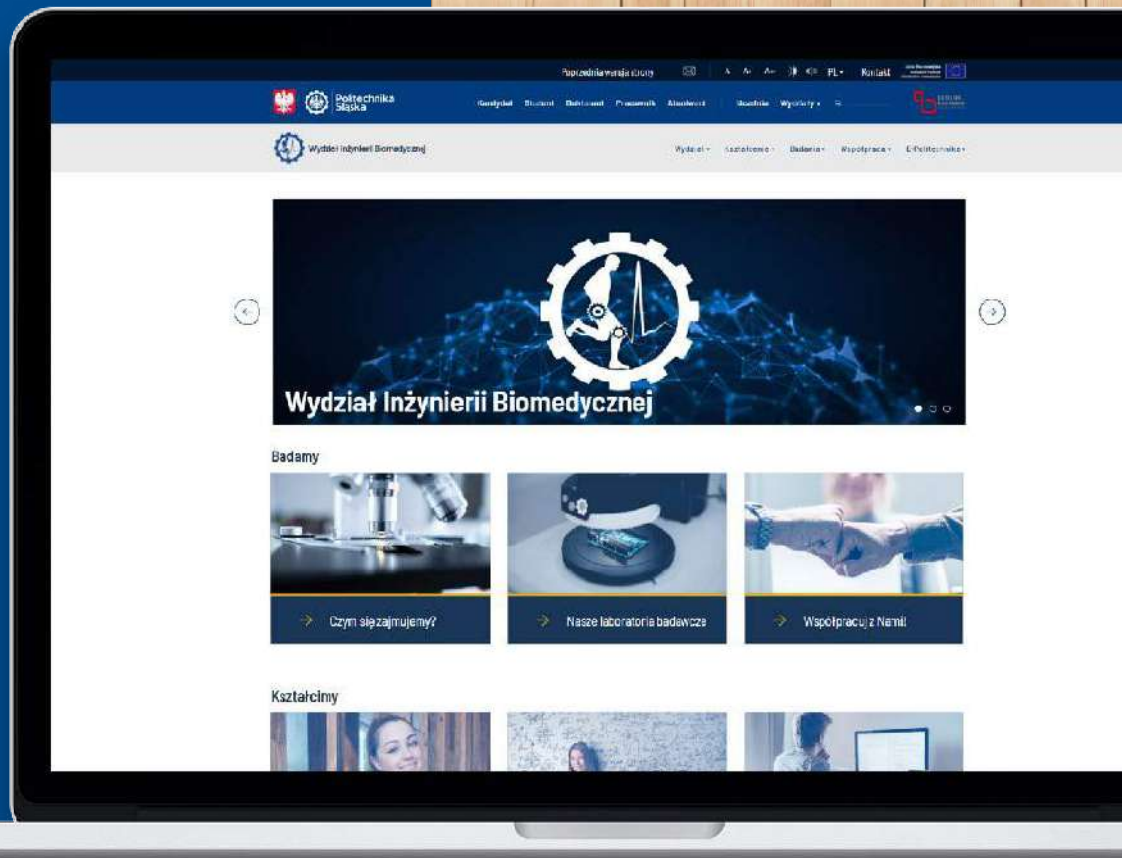
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Center*

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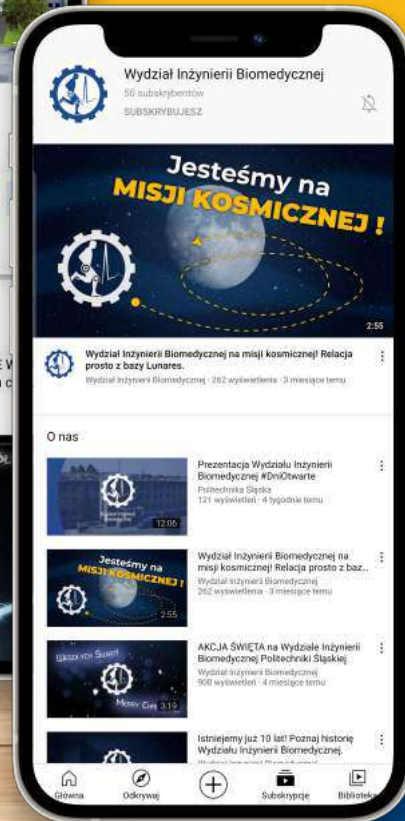
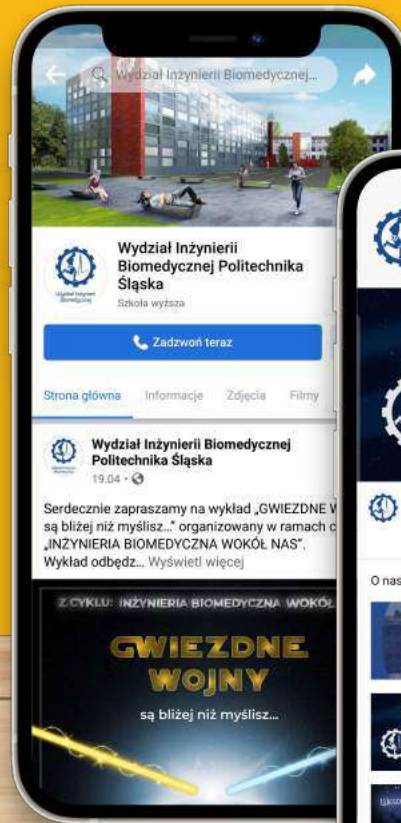
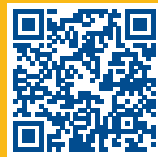
*be sure to check out our
website!*

ib.polsl.pl



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Only the latest information on our fanpage :)



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Join us!

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email: rib0@polsl.pl

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e-mail: wib_rekrutacja@polsl.pl

https://apply.polsl.pl/en_GB/



See you soon!



Silesian
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**RESEARCH
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Faculty of
Biomedical Engineering

