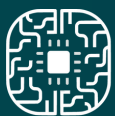


2024

# BREAKING GLOBAL FRONTIERS

BIOMEDICAL ENGINEERING  
AROUND THE WORLD



**ANEEB**  
Associação Nacional de Estudantes  
de Engenharia Biomédica



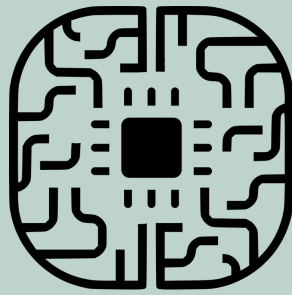
**GUBSA**  
Griffith University  
Biomedical Student Association



# CONTENT

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- Portugal: ANEEB ..... 2
- Netherlands: GLV Idun ..... 7
- France: APLEB ..... 15
- Australia: GUBSA ..... 20
- Canada: CEGB ..... 24



# ANEEB

Associação Nacional de Estudantes  
de Engenharia Biomédica

## ABOUT ASSOCIATION



The Portuguese Biomedical Engineering Students' Association (ANEEB), statutorily defined as a federation, is a non-profit association founded in Coimbra on October 5, 2017. Since its inception, ANEEB has been governed by a set of essential values aimed at mitigating and addressing gaps in the field of Biomedical Engineering within the national territory. Throughout its terms, it has established itself as a key element in bridging the gap between students, educational institutions, institutional entities, and employers, promoting the alliance between technology and healthcare. Among the numerous events it organizes, the highlights for this term include the 2nd Edition of the National Conference of Biomedical Engineering, the Team Weekend, the +ANEEB project, and the 5th Edition of the Health Hackathon, which are significant milestones in promoting Biomedical Engineering in Portugal. These events are informative, social, and cultural in nature, organized by students for students.

Thus, ANEEB focuses its activities on four fundamental competencies that define its areas of action:

- Providing opportunities for students to enhance their knowledge and skills in Biomedical Engineering.
- Facilitating connections between students, professionals, and institutions to foster collaboration and professional growth.
- Encouraging and supporting innovative projects and research in the field of Biomedical Engineering.
- Engaging with the broader community to raise awareness and understanding of Biomedical Engineering and its impact on society.



[www.aneeb.pt](http://www.aneeb.pt)



[www.linkedin.com/company/aneebiomedica/](https://www.linkedin.com/company/aneebiomedica/)



[@aneeb.pt](https://www.instagram.com/aneeb.pt)



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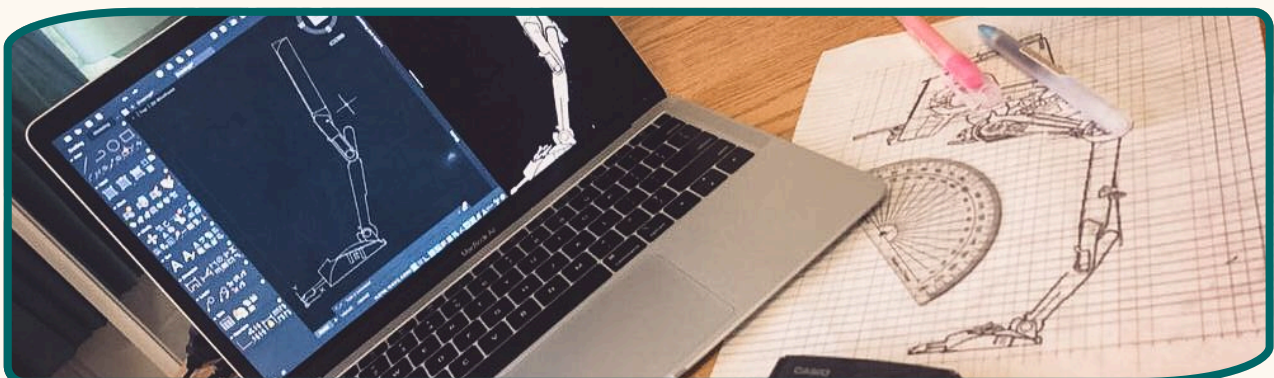
# BIOMEDICAL ENGINEERING IN OUR COUNTRY

Biomedical Engineering is a rapidly expanding field in Portugal, recognized for its pivotal role in advancing healthcare through technological innovation. Portuguese universities like the University of Coimbra, the University of Porto, and the University of Lisbon offer comprehensive programs that blend **engineering, biology, and medicine**, equipping students with essential skills and knowledge.

The industry is thriving, with a growing number of companies driving innovation in **medical devices, diagnostics, and healthcare IT solutions**. Startups and established firms alike are contributing to the development of advanced **healthcare technologies**, making significant impacts on both the local and global markets.

Biomedical Engineers are in high demand, working in research institutions, medical device companies, regulatory agencies, and consulting firms, where they develop and maintain medical equipment, create new technologies, ensure regulatory compliance, and provide expert advice to optimize healthcare operations and technologies.

The **future of Biomedical Engineering in Portugal** is promising, with continuous technological advancements and an increasing focus on personalized medicine driving growth and demand for skilled professionals. However, to fully realize this potential, several **changes are necessary**, including greater recognition and valuation of professionals, improved career progression opportunities, and increased investment in research and development by the country. These steps will enhance the integration and value of Biomedical Engineers within hospital environments and further impact patient care and the job market.

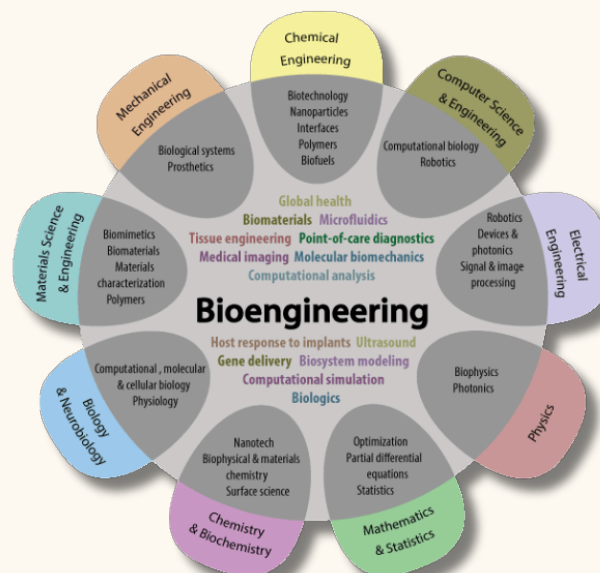


# BIOMEDICAL ENGINEERING DEGREE AND MAIN AREAS

Biomedical Engineering degrees in Portugal are structured to provide comprehensive education in both engineering and biological sciences. The curriculum typically includes core courses in medical imaging, biomaterials, biomechanics, and medical device development. The degree comprises a 3-year bachelor's program where students build strong foundations in general engineering areas and biological sciences. In some universities, it is mandatory for students to develop a bachelor's project, which can be completed either in the research field or as an internship.

After the bachelor's program, students can enroll in a master's program to be recognized as engineers. Here, they can specialize in areas such as medical imaging, bioinformatics, biomaterials, biomechanics, neurosciences, biomedical instrumentation, tissue engineering, and clinical engineering. In the final year of the master's program, students undertake a master's thesis—an investigation project developed either in research centers or in companies that are willing to receive the student.

While many areas are emerging, bioinformatics ends up being the area with the highest employability, as companies recognize the skills of biomedical engineers to translate the needs of the healthcare industry into effective computational solutions. Biomedical engineers in this field are adept at managing and analyzing complex biological data, developing algorithms for medical research, and creating software tools that support clinical decision-making and personalized medicine. This high demand is driven by the increasing reliance on data-driven approaches in healthcare, making bioinformatics a critical and rapidly growing sector within biomedical engineering in Portugal.



# MOBILITY PROGRAMS

Portuguese universities welcome exchange students through various mobility programs, such as Erasmus+. These programs offer international students the opportunity to study in Portugal and experience its vibrant culture. University international offices facilitate contacts for mobility programs, offering assistance and information regarding application procedures, accommodation, and integration into the academic community. The contacts for mobility coordinators at the universities represented by ANEEB are:

- Faculdade de Engenharia da Universidade do Porto: [outgoing@fe.up.pt](mailto:outgoing@fe.up.pt)
- Instituto Superior de Engenharia do Porto: [relacoes.externas@isep.ipp.pt](mailto:relacoes.externas@isep.ipp.pt)
- Universidade Católica Portuguesa: Mónica Coutinho ([mcoutinho@porto.ucp.pt](mailto:mcoutinho@porto.ucp.pt)) - exchange coordinator or [international@porto.ucp.pt](mailto:international@porto.ucp.pt)
- Universidade de Aveiro: [incoming@ua.pt](mailto:incoming@ua.pt)
- Universidade de Coimbra: Rui Davide Martins Travasso ([ruit@uc.pt](mailto:ruit@uc.pt))
- Universidade de Trás-os-Montes e Alto Douro:
- Universidade do Minho: Maribel Yasmina Campos Alves Santos ([info@eng.uminho.pt](mailto:info@eng.uminho.pt))
- Instituto Superior Técnico: Rita Nunes ([mobilidade.biomedica@bioengenharia.tecnico.ulisboa.pt](mailto:mobilidade.biomedica@bioengenharia.tecnico.ulisboa.pt))
- NOVA School of Science and Technology (FCT NOVA): João Cruz ([df.coord.era@fct.unl.pt](mailto:df.coord.era@fct.unl.pt))
- Faculdade de Ciências da Universidade de Lisboa: Alexandre Andrade ([aandrade@ciencias.ulisboa.pt](mailto:aandrade@ciencias.ulisboa.pt))





Portugal offers a rich cultural experience, characterized by a warm climate, stunning landscapes, and a welcoming community. Students can enjoy a balanced lifestyle with access to historical sites, beautiful beaches, and a variety of recreational activities. The cost of living in Portugal is relatively affordable compared to other European countries, making it an attractive destination for international students.

In addition to Erasmus+, students can often participate in supplemental programs that assist in exploring opportunities beyond Europe. For instance, the FLAD (Luso-American Development Foundation) scholarships support Portuguese students undertaking research projects in the United States, providing valuable international experience and enhancing academic development.

For internship opportunities, students can reach out to university career services or directly contact companies and research institutions in the biomedical field. ANEEB also offers resources and networking opportunities to help students connect with potential employers and gain valuable work experience. Examples of companies willing to host students for internships can be found [here](#)!

Some examples of companies willing to receive students for internships can be found [here](#), and some other companies, with focus on biomedical engineering areas can be found [here](#)!



# ABOUT ASSOCIATION



GLV Idun (Groninger levenswetenschappenvereniging Idun) is the study association for bachelor and master students in the Life Sciences at the University of Groningen. The total members count is around 2000 each year. The association has 20 committees and organizes approximately 150 activities per year. The association has multiple purposes for its members; support in education, organizing social events, providing insights in future career paths, etc. The members of a study association are characterized by their study program, contrary to a student association of which the members' study program is not relevant. Joining a study association gives an extra dimension to your student life in Groningen!

## GLV Idun is the study association for the BSc:

- Biology:
  - Behaviour and Neurosciences
  - Biomedical Sciences
  - Ecology & Evolution
  - Integrative Biology
  - Molecular Life Sciences
- Biomedical Engineering
- Life Science & Technology

## GLV Idun is the study association for the BSc:

- Behavioural and Cognitive Neurosciences
- Biology
- Biomedical Engineering
- Biomedical Sciences
- Biomolecular Sciences
- Ecology and Evolution
- Marine Biology
- Molecular Medicine and Innovative Treatment
- Behavioural and Cognitive Neurosciences

GLV Idun was established while signing the merger contract on the 1st of June 2006. After this moment, Biology and Life Science & Technology no longer had their separate associations but had a study association together.



The 'Groninger Biologen Club' (GBC) was the study association for Biology. It existed since 1919 and was a broad association with seventeen committees. The GBC was located in Haren, where they organized a drink every Thursday in their members' room, called 'De Suite'. This tradition still exists in the new Suite located in the Linnaeusborg. At the beginning of GBC, they mostly organised excursions. When they got more members, they got more committees and activities. In this time some familiar names arose like the InNatura (excursion committee).

Groningen started with the study Life Science and Technology in 2002. Soon there were students wanting a study association of their own. This is when S.V. Melior Vita came into existence on April 4th 2003. The main point of this year was expanding the association, like recruiting members, starting up committees, first GMAs and the first dies. In this year, the first edition of 'Idioot op de boot' took place in cooperation with Lugus and FMF. This party later became 'Prominent in de Tent'.

After a few years, the studies Biology and Life Science and Technology were combined by the university in a broad bachelor. Both study associations decided to adapt and prepared a merger. In the year preceding the merge, both associations organized some activities together, like the symposium and some socials to get to know each other. At the end of the merge, there was a closing party in May. The theme of this party was: 'Neanderthalers, back to the beginning'.



[www.idun.nl](http://www.idun.nl)



[www.linkedin.com/in/glv-idun/](http://www.linkedin.com/in/glv-idun/)



[@glvidun](https://www.instagram.com/glvividun)



*Nijenborgh 7, Building 5173, Room 0171  
9747 AG Groningen*

# BIOMEDICAL ENGINEERING IN OUR COUNTRY

BME is a degree that sounds specialised but is actually an incredibly wide field. In Groningen the master's is therefore split between medical device design, biomaterials and Imaging. In general, biomedical engineering is seen as difficult but interesting and with practically guaranteed career opportunities. Even if one would not want to stay in the field of BME, you are still a university schooled engineer. All three splits of BME are booming because the medical world is relying more and more on technology.

So in short, by the students themselves it is perceived as difficult but doable and interesting. By companies and institutions it is seen as a very valuable degree.

## INSIGHT OF A BME STUDENT:

*Studying biomedical engineering at the University of Groningen has been an incredible experience for me. Over the past three years, I have had the opportunity to delve into a wide range of disciplines, from biology and physics to computer science and materials engineering. What I love most about this programme is how multidisciplinary it is, allowing me to gain a truly holistic understanding of the field and its potential applications.*

*One aspect of my studies that I find particularly fascinating is the design work. It's amazing to see how the theories and concepts we learn in the classroom can be applied to real-world problems, and how we can use engineering principles to create medical devices that improve people's lives. I'm especially drawn to the idea of designing medical devices that can help people take control of their own health, and ultimately make healthcare more affordable and accessible to everyone.*

*Outside of my studies, I've had plenty of time to pursue my other passions. Groningen is an amazing city that offers so many opportunities for sports and other activities. In fact, I've been able to stay active by participating in a number of sports leagues and clubs, and have taken on a part-time job to help me finance my studies.*

*But what really sets the University of Groningen apart, in my opinion, is the sense of community and support that I've found here. The study association has been an incredible resource, providing me with everything from study materials and mentorship to social events and networking opportunities. And my professors and peers have been incredibly supportive and encouraging, pushing me to achieve my best while also helping me stay grounded and focused. Overall, I would recommend the University of Groningen to anyone interested in biomedical engineering.*

# BIOMEDICAL ENGINEERING DEGREE AND MAIN AREAS

## AREAS WITH THE MOST PROMINENCE:

Biomedical engineers, who are trained on the crossroads of engineering and medical and biological sciences, are required to realize future health care. As a student, you will be trained to work in multidisciplinary teams, to have a broad overview, to create innovative devices and to perform research that forms a basis for better and more sustainable healthcare (in terms of costs and manpower). You will be both researcher and designer, the best basis for an academic professional.

You will study topics in the field of imaging techniques (like MRI, PET,CT), medical robot design, prosthetics and orthotics, implants and artificial organs, tissue engineering and biomaterials, as well as aspects of medical ethics. During the programme, you will work on real-life problems, such as designing artificial heart valves that last longer, studying the process of joint implant ingrowth by bone, automatic analysis of MRI images to check for abnormalities.



You will learn to communicate and collaborate with engineers, physicians, biologists and biochemists, all with different backgrounds. This is necessary for research and design of new diagnostic and therapeutic devices and techniques that are required in healthcare. In addition, you will also learn to focus on preventive devices and techniques to allow older citizens a healthy ageing; stay healthy as long as possible.

## HOW THE COURSE IS STRUCTURED:

In the first year you learn basic knowledge and skills in engineering science, including physics, mathematics, and supplemented with biology and design.

In the second year you will be further trained as a biomedical engineer and you will be introduced to Imaging Techniques (MRI, CT), Designing Medical Devices and Biomaterials for Implants and Tissue Engineering.

In the third year you choose one of these directions to specialize in. You gain experience in research and with R&D. You complete your bachelor's degree with your own research or design implementation.

Some of the related master's programmes are:

- Mechanical Engineering
- Industrial Engineering and Management
- Molecular Medicine and Innovative Treatment
- Innovative Medicine
- CPE Track Health Systems and Prevention - Research
- Science Education and Communication
- Energy and Environmental Sciences
- Biomedical Engineering
- Artificial Intelligence
- Clinical and Psychosocial Epidemiology - Research
- Clinical Linguistics / EMCL - Research
- Business Administration: Health
- CPE Track Lifecourse Health Development - Research



How many years:

The biomedical engineering bachelor is 36 months in total.

You will be offered study advice after the first year of study. You can expect a positive result if you have earned more than 45 ECTS credit points (out of a total of 60 ECTS). If you have earned fewer than 45 ECTS and are issued a negative result, you will not be allowed to continue with your degree programme.

A bachelor's program consists of 180 credits, so-called ECTS. There are 60 ECTS per year; most subjects consist of 5 ECTS.

## Optional and mandatory courses:

All first year courses need to be finalized before you are allowed to start any 3rd year courses of period 1b, 2a or 2b.

Green=semester 1a, Blue=semester 1b, Red= semester 2a, Yellow= semester 2b

## Year 1:

Course	Type	ECTS (points)
Calculus (for BME)	Mandatory	5
Mammalian Cell Biology	Mandatory	5
Principles of Design Engineering	Mandatory	5
Anatomy and Physiology	Mandatory	5
Biomechanics	Mandatory	5
Material Science	Mandatory	5
Ethics 1: Philosophy of Science & Scientific Integrity	Mandatory	2
Molecules of Life for BME	Mandatory	5
Physics Lab for BME	Mandatory	3
Statistics 1 for BME	Mandatory	5
Biomaterials 1	Mandatory	5
Linear Algebra for BME	Mandatory	5
Microbiology	Mandatory	4
Safe Microbiological Techniques BME	Mandatory	1

## Semester 2a

For the compulsory elective in period 2a you need to choose 1 course form this list:

- BSE: WBBE044-05 Physicochemical Concepts in Bionanotechnology
- MDD: WBBE048-05 Biomedical Sensors
- MI: WBBE043-05 Imaging Laboratory 2 (max 35 students)

**Semester 2b**

- **Electives - you need to choose 3 courses from 2 specializations:**
- **BSE:** Lab course Biomaterials (max. 30 students)
- **BSE:** Surface Characterization
- **MI:** Imaging Laboratory 1 (max. 35 students)
- **MI:** Image Processing
- **MDD:** Biological Physics (max. 45 students)
- **MDD:** Transport in Biological Systems

**BSE=Biomaterials Science and Engineering; MI=Medical Imaging; MDD=Medical Device Design**

**Year 2:**

Course	Type	ECTS (points)
Dynamics and Vibrations	Mandatory	5
Mathematical Tools (for BME)	Mandatory	5
Python and Numerical Methods	Mandatory	5
Designing biomedical products 2	Mandatory	4
Electricity and Magnetism	Mandatory	5
Ethics 2: Biomedical Ethics	Mandatory	1
Thermodynamics	Mandatory	5
Physics and Technology of Medical Imaging	Mandatory	5
Signals and Systems	Mandatory	5
Waves and Optics for BME	Mandatory	5
Biological Physics	Elective	5
Biomedical Image Processing	Elective	5
Imaging Laboratory 1	Elective	5
Lab course Biomaterials	Elective	5
Surface characterization	Elective	5
Transport in Biological Systems	Elective	5

## Year 3:

Course	Type	ECTS (points)
Applied Medical Visualization	Elective	5
Biofabrication	Elective	5
Biomedical Instrumentation	Elective	5
Designing biomedical products 3	Elective	5
Microscopy and Imaging	Elective	5
Polymeric Materials for Biomedical Applications	Elective	5
Ethics 3: Research Ethics	Mandatory	2
Research course BME	Mandatory	8
Thermodynamics	Mandatory	5
Biomedical Sensors	Elective	5
Electronics	Mandatory	5
Imaging Laboratory 2	Elective	5
Physicochemical Concepts in Bionanotechnology	Elective	5
Tissue Eng. and Regen. Med.	Mandatory	5
Bachelor's Project BME	Mandatory	15

**MINOR**

For the Biomedical Engineering Deepening Minor in period 1a you can choose one of the below mentioned course packages of 15 ECTS. It is not possible to mix minor courses of different minor packages.

**Minor Medical Device Design**

WBBE052-05 Biofabrication  
 WBBE003-05 Biomedical Instrumentation  
 WBBE004-05 Design of Biomedical Products 3

**Minor Medical Imaging**

WBBE003-05 Biomedical Instrumentation  
 WBBE058-05 Microscopy and Imaging  
 WBBE045-05 Applied Medical Visualization

**Minor Biomaterials Science and Engineering**

WBBE052-05 Biofabrication  
 WBBE058-05 Microscopy and Imaging  
 WBBE056-05 Polymeric Materials for Biomedical Applications



# ABOUT ASSOCIATION



Since 2013, the Association of engineering Students in Biomedical specialism of Polytech Lyon kept growing. At the heart of the momentum of the Biomedical Engineering specialism, new projects are regularly born, led by students who are more motivated than ever. In line with previous mandates, the board members are committed to maintaining the professional image of the sector in all its projects. This year, our goal is to bring to light the power of Polytech's network in the biomedical field by creating an annually updated directory of former students and their professional careers. Moreover, we aspire to promote interconnection with other specialities of the school by inviting them to actively participate in all our initiatives.

Drawing on the experience of its projects, APLEB helps bring great visibility to the Polytech Lyon school in the professional world through numerous meetings. The association is also keen to encourage student initiatives, by remaining attentive to the needs of new promotions and promoting new projects.

As of today, the association brings together 5 projects :

- **Le Ptit Biomed ® (The Little Biomed)** : Created in 2011, this project, conducted by the students from the biomedical engineering specialism, combines all of the AFIB (French Association of Biomedical Engineers) days in a guide. Every year, the AFIB hosts a congress, which brings together biomedical engineers, companies and professionals from the medical field. To carry out this project, the association is in collaboration with the SantExpo trade fair, where students carry out interviews with professionals in the biomedical field. This exhibition takes place every year in Paris and brings together players in the health and medico-social sector: health professionals, decision-makers, researchers, startups and associations, companies, etc.



- **Biom'aide (Biom'help)** : Initiated in April 2019, this project aims to provide development assistance in the biomedical field in Senegal. For this, the project is in collaboration with the Horizons Sahel association. The team organizes medical devices collections in hospitals in order to send them to Senegal. We also organize a humanitarian internship in Senegal. Before their departure, student volunteers benefit from 10 days of technical training on device maintenance. During this internship, students help with the maintenance and repair of devices in hospitals. They also participate in the optimization and organization of the technical service and provide monitoring of the devices.
- **Les Ateliers Biomédicaux (Biomedical Workshops)** : Created in 2013, the biomedical workshops set up fun workshops to allow students to have privileged contact with companies, through enriching meetings and interviews with professionals. Companies come to the school to present their equipment, their mission and sector of activity.
- **La Minute Biomed (The Biomed Minute)** : The team behind this project produces a monthly newsletter, sent to more than 1,000 professionals and students, on technological monitoring in the biomedical world.
- **Le Guide du GBM (The GBM (BioMedical Genius) Guide)** : This project was launched in June 2023. It aims to communicate summary sheets on services in hospitals, medical devices or even biomedical engineering professions. This guide is intended to be shared with new students in the sector in order to facilitate their integration into their various internships and missions at the hospital.



[bdepolytechlyon.fr](http://bdepolytechlyon.fr)



[www.linkedin.com/company/aleb](http://www.linkedin.com/company/aleb)



[@aleb.gbm](https://www.instagram.com/aleb.gbm)



**Batiment Istil 15 RUE ANDRE LATARJET  
69100 VILLEURBANNE**

# BIOMEDICAL ENGINEERING IN OUR COUNTRY

The biomedical field in France is generally well perceived and recognized, particularly in booming sectors such as Robotics and Research and Development (R&D). These fields are particularly valued because of their potential to revolutionize the world of health. However, in the hospital environment, the biomedical service remains unknown and insufficiently recognized by other services.

Regarding education, some big French engineering schools offer specialized training in biomedical engineering. For example, schools such as Polytech Lyon, Polytech Marseille, l'Université de Technologie de Compiègne (UTC) or l'Institut National des Sciences Appliquées (INSA) offer curriculums which lead to an engineering degree, recognized by the CTI, the Commission des Titres d'Ingénieurs (in english: The Accreditation authority for French professional engineer). They provide a solid background in engineering science, completed by a specialization in biomedical technologies.

Yet, biomedical engineering is not always easily accessible. Indeed, the schools offering this specialty are, for the large majority, private (which implies higher tuition fees than in public schools).

Finally, many French universities offer master's degrees in biomedical engineering. These programs are often very specialized and focused on research or clinical applications. However, although these master's degrees are of a high level, they do not give access to the title of engineer in France, which can be an obstacle for students wishing to obtain equivalent professional recognition.

There is however a tendency to strengthen collaborations between engineering schools and universities to offer integrated courses which make it possible to obtain both an engineering diploma and a specialized master's degree.

We can therefore say that the biomedical field in France has a promising future, it is booming, but there is still progress to be made.



# BIOMEDICAL ENGINEERING DEGREE AND MAIN AREAS

## AREAS WITH THE MOST PROMINENCE:

The courses offered vary depending on the school. Overall, we mainly find medical imaging, biomechanics, electronics and robotics. For example, at Polytech Lyon, our courses are more oriented towards the research and development of medical devices, and we have virtually no biomechanics courses. We acquire very broad knowledge on a large part of the biomedical fields (computer science, electronics, imaging, radiation physics, engineering profession, project management, etc.)



## HOW THE COURSE IS STRUCTURED:

From an overall point of view, for engineering schools, the course takes 5 years, with 2 years of preparatory class, often general (maths, physics, chemistry), followed by 3 years of specialism.

At Polytech Lyon, courses are divided into : practical work, tutorials (application exercise) and lectures. In addition, we have 3 mandatory internships to complete during our 3 years of specialization:

- 1 between the third and fourth year of 7 weeks, in a hospital environment (technician or assistant engineer)
- 1 of 16 weeks during the first semester of 4A in the desired field (assistant engineer)
- 1 of 24 weeks in the second semester of the 5A year, in the field you want (engineering internship)

During our years of specialization we are also obliged to undertake mobility abroad (5 months), either in the form of an internship or in the form of a university exchange (ERASMUS). We can therefore complete it either in 4A during our internship semester, or in 5A in the first semester (ERASMUS), or during the second semester internship.

Still at Polytech Lyon, during the fifth year, several courses are available:

- **MISS double degree:** focused on research methods and development. It allows you to acquire knowledge in order to complete a potential thesis.
- **ATRDM double diploma:** it allows you to acquire notions of regulations relating to medical devices. The courses are mainly focused on the manufacturing standards to be respected, the regulations relating to use, maintenance, etc. Students can then work in an R&D center.
- **ERASMUS:** during the first semester of 5A, the student can go to a partner university in Europe or outside Europe
- **Classic course:** the student follows the 5A biomedical courses at Polytech Lyon during the first semester then goes on an internship
- **Professionalization contract:** engineering mission within a company for the full year (the student therefore does not complete an end-of-year internship). Alternation rhythm:
  - 3 days at school and 2 days at work from September to February (first semester)
  - 1 month in a company and 3 days at school from February to August (second semester)

### How many years

The biomedical engineer training lasts a total of 5 years and is governed by the CTI, two ways are possible:

**Classic way:**

- 2 years of preparatory class (general)
- 3 years of specialty with 3 compulsory internships (3A, 4A, 5A)
- mobility abroad

**Other way:**

- on file examination with a minimum BAC+2 (two-year higher education diploma) such as a bachelor's degree, PACES (first-year common curriculum in health), DUT (two-year university degree in technology), radiographer's degree, etc
- 3 years of specialism with 3 compulsory internships (3A, 4A, 5A)
- mobility abroad

### Optional and mandatory courses

At Polytech Lyon (optional and mandatory courses can vary from a school to another)

**Optional courses (5A) :**

- Professionalization contract
- Double master's degree
- University exchange

**Mandatory courses:**

- Physics (electronics, radiation, computer science, acoustics, signal treatments)
- Biomedical (imaging, anatomy, physiology, engineer careers, technical platforms)
- Company (management, project management, personal project, performance improvement)
- Mobility abroad
- Language (TOEIC B2 = 785 pts)
- Societal actions

# MOBILITY PROGRAMS

Polytech Lyon welcomes exchange students for a semester or a year:

- [international@polytech-lyon.fr](mailto:international@polytech-lyon.fr)

Lyon1 University welcomes exchange students for a semester or a year:

- [didier.leonard@univ-lyon1.fr](mailto:didier.leonard@univ-lyon1.fr) - International Relations Director
- [benedicte.marti@univ-lyon1.fr](mailto:benedicte.marti@univ-lyon1.fr) - International Relations assistant

## Lifestyle in the Country

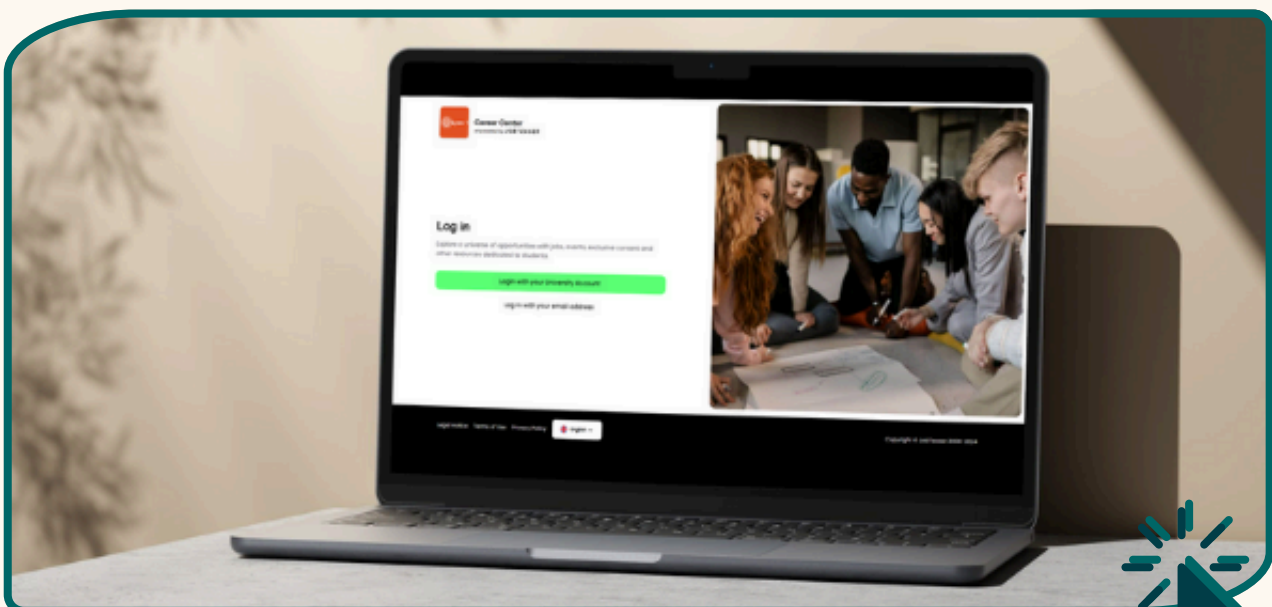
French gastronomy is varied and widely recognized throughout the world for its excellence. College towns are often bustling with bars, cultural venues and other places to have fun. There are also Facebook groups for the integration of international students.

France is a country with many different landscapes and a diversity of regions, ideal for weekend visits or vacations:

- Sea, mountains, lakes, forests (to ski, hike or go to the beach...);
- Castles, little picturesque villages, major tourist cities (tours, shopping, restaurants...);
- Mostly hot climate in the south;
- Mostly cold climate in the north.

## Contacts for Internships

To find internship opportunities, students can consult their university's career services or directly reach out to companies and research institutions in the biomedical sector. The University Claude Bernard Lyon 1 also offers a Career Center platform, with hundreds of job offers, internships and work-study programs for students, as well as company fact sheets, student testimonials and practical advice. The platform can be found [here](#).





# GUBSA

Griffith University

Biomedical Student Association

## ABOUT ASSOCIATION



Griffith University Biomedical Student Association (GUBSA) is a student-run organization for biomedical science students as well as students within other science disciplines at Griffith University's Nathan Campus. GUBSA organizes a mix of professional development and social events throughout the academic year that give students the opportunity to collaborate and network with future professional peers, make industry connections, and find opportunities to upskill for their careers in biomedical science, and enjoy university life a little more.



[griffith.campusgroups.com/gubsa/](https://griffith.campusgroups.com/gubsa/)



[www.linkedin.com/company/griffithgubsa/](https://www.linkedin.com/company/griffithgubsa/)



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# BIOMEDICAL ENGINEERING IN OUR COUNTRY

Biomedical engineering is highly regarded in Australia, with a strong emphasis on innovation and practical applications in healthcare. The field is seen as crucial for developing cutting-edge medical technologies that significantly improve patient care. The Australian Government's Job Outlook indicates that biomedical engineering is a career path with strong future growth, reflecting its positive outlook and growing demand.

Educational opportunities in biomedical engineering are abundant in Australia. Top universities offer comprehensive programs that attract students from around the world. These institutions collaborate with hospitals and industry partners to drive research and create innovative medical solutions, further enhancing the field's reputation.

Career prospects for biomedical engineers in Australia are promising. There is a strong demand for professionals in various sectors, including hospitals, medical device companies, and research institutions. Biomedical engineers enjoy competitive salaries and opportunities for career advancement, making it an attractive career choice.

The public perception of biomedical engineering in Australia is positive, as the field is associated with significant contributions to healthcare and quality of life. Exciting technological advancements, such as bionic limbs and tissue engineering, add to the field's appeal and highlight its impact on improving patient outcomes. Overall, biomedical engineering is viewed as a dynamic and impactful field in Australia, offering numerous opportunities for growth and innovation.



# BIOMEDICAL ENGINEERING DEGREE AND MAIN AREAS

## AREAS WITH THE MOST PROMINENCE:

Biomedical engineering in Australia covers a wide range of specializations, with some of the most prominent areas including biomaterials and tissue engineering, medical imaging, bionic limbs and prosthetics, bioinformatics and genomics, and nanotechnology. These areas are at the forefront of innovation, driving advancements in healthcare and improving patient outcomes.

## HOW THE COURSE IS STRUCTURED:

The structure of biomedical engineering courses in Australia typically includes a combination of classroom training and industry placements. For example, RMIT University's Bachelor of Engineering (Biomedical Engineering) (Honours) program includes both local and international industry placements. Most colleges in Australia have a professional practice component that usually involves 12 weeks of industry exposure. These practical experiences are designed to provide students with hands-on skills and real-world insights.

### How many years

The duration of biomedical engineering programs in Australia varies. A bachelor's degree typically takes 4 years to complete full-time or 8 years part-time. A master's degree generally takes 2-3 years full-time, depending on prior study. These programs are designed to equip students with the necessary knowledge and skills to excel in the field.

### Optional and mandatory courses

Biomedical engineering programs include a mix of core and elective courses. Core courses are mandatory and cover fundamental topics such as biomechanics, medical electronics, and engineering science. Elective courses allow students to tailor their education to their interests, with options such as bioelectronics, biocomputational, and nanoscale biotechnology available at institutions like Griffith University or other universities like the University of Sydney.

At Griffith, we focus more on the Biomedical side of the study. Griffith's Bachelor of Biomedical Science requires an expected 3 years full-time in order to complete. Our classes focus more on the medical side like Neuroscience or Molecular cell biology (can be changed for interesting classes that you know). But we offer a variety of technology courses with a focus on Nano tech with our Micro and Nano tech center under our engineering department. We ourselves don't have a direct biomedical engineering degree however we offer both biomedical and engineering courses which you can pick and choose from when you apply to Griffith as there are no restraints for taking classes under one specific major only.



# MOBILITY PROGRAMS

Griffith University has over 100 exchange partners worldwide. Going through the Griffith University website you can find all the information you need to apply, including a directory to find an international recruitment agency or provider, step by step instructions on applying to study abroad at Griffith University and the contact details for student services.

## Directly contact our Biomedical Science Club:

- Email: [griffithgubsa@gmail.com](mailto:griffithgubsa@gmail.com)
- Discord: <https://discord.gg/DQr3tQ2342>
- Link tree: <https://linktr.ee/griffithgubsa>

## Applying to Study Abroad at Griffith:

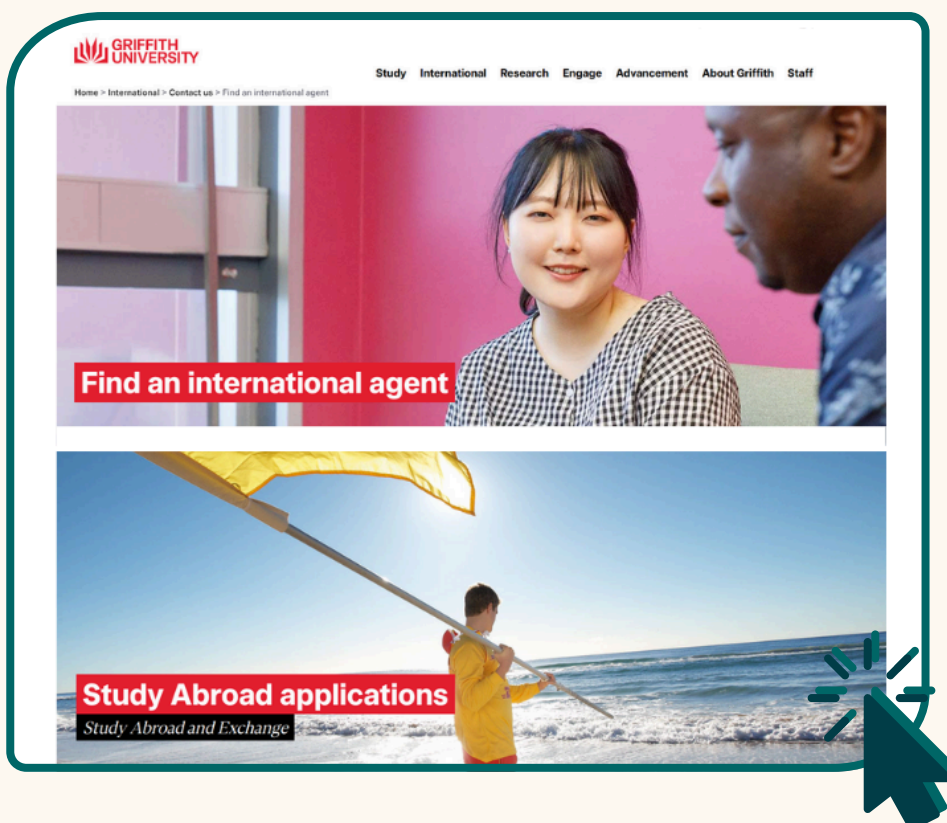
- <https://www.griffith.edu.au/international/global-mobility/inbound>
- <https://www.griffith.edu.au/international/global-mobility/inbound/how-to-apply/study-abroad-program>

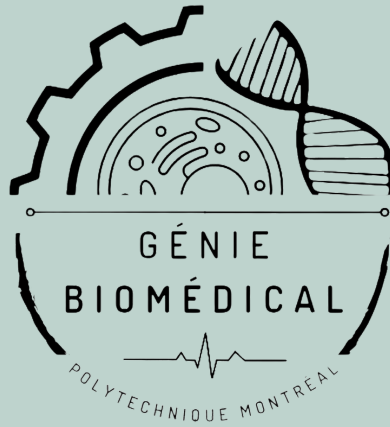
## International Recruitment Agencies:

- <https://www.griffith.edu.au/international/contact-us/international-agents>

## Student Services:

- Study enquiry: 1800 677 728
- International students: +61 7 3735 6425





# ABOUT ASSOCIATION



The CEGB is the committee representing the Biomedical Engineering Students at Polytechnique Montreal. It falls under the Student Association of Polytechnique (AEP) for all financial and legal matters. Our goal is split in 3 fields. First, we offer team-building activities (social, sporting, artistic, etc.) which create a sense of belonging between each cohort. Second, we serve as a point of contact with the biomedical industry by organizing networking events, conferences, company visits, industrial trips, etc. Third, we listen to the ups and downs of the students' academic life throughout the year while participating in committee meetings to discuss the constant improvements of our program concerning, for example, the classes.

We are 10 people:

- **President:** Overlooks the entire functioning of the committee
- **Treasurer:** Handle all the money side of our committee
- **Assistant:** Building guides to help students with their classes, updating a Google Drive with examination records, helping with committee tasks
- **External VP:** Organizing conferences and industry student trips (New York, Boston, etc.), maintain relations with contacts, sponsorships
- **Internal VP:** Taking care of the biomedical student room, snacks, sofas, etc.
- **Networking Event VP:** Handle the yearly networking wine and cheese event with more than 50 companies and research laboratories.
- **Social VP:** Organize activities for all students to increase cohesion and exchange in a non-educational environment
- **Educational VP:** Ensure that the academic life is up to standard and propose improvements for consequent years
- **Marketing VP:** Handle all communications to students about important events or information
- **1st-year representative:** Direct liaison between the student committee and the first-year students to ensure efficient communication and proper integration into the program



2500, chemin de Polytechnique  
Montréal (Québec) H3T 1J4



[www.linkedin.com/company/aneebiomedica/](http://www.linkedin.com/company/aneebiomedica/)



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# BIOMEDICAL ENGINEERING IN OUR COUNTRY

## By external people (that we meet in our day-to-day):

- When people first hear about Biomedical Engineering, their reaction is that it is impressive and that we must be crazy smart geniuses who conceive complicated projects. Afterward, some people might ask more questions as they don't know what it is since it is still a new field of study. They ask what we do, what are the work opportunities, why their aunt's hip hurts when she walks, etc... questions even we don't always know the answer to. In summary, impressive and unknown.
- Sometimes people get stuck on the "biomedical" part more than the "engineering" part, and think it is more related to biosciences, biology, and medicine.

## By the industry:

- Polyvalent (knowledge in electronics, programming, biochemistry, physics, mathematics, project management, etc), resourceful, great adaptability and problem-solving capabilities...

## By students from other programs in Polytechnique:

- We must be brilliant because it is an exclusive program (especially in Toronto or Vancouver: it requires high grades to get into)
- We know a little bit about every program, but we aren't experts in anything

## By students in Biomedical Engineering themselves:

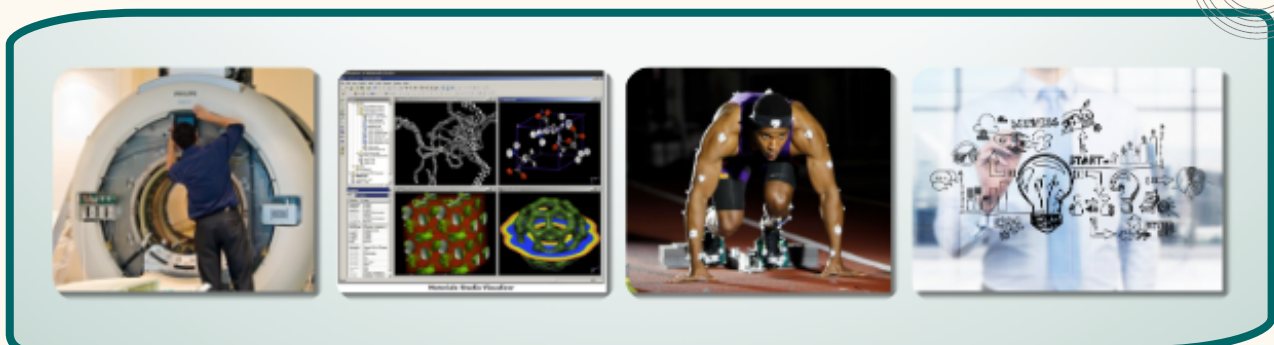
- We lack fascinating job opportunities in Quebec
- We love the concept of the program but find it hard to translate it into a real future yet when compared with other Canadian cities.



# BIOMEDICAL ENGINEERING DEGREE AND MAIN AREAS

## AREAS WITH THE MOST PROMINENCE:

- Clinical Engineering (hospitals)
- Research (biomaterials, modeling, and simulation...): a lot of companies encouraging research such as TransMedTech
- Biomechanics
- Entrepreneurship



## HOW THE COURSE IS STRUCTURED:

- To begin, it is important to know that at Polytechnique, an engineering-only university, the Biomedical Engineering program is a collaboration between 5 departments : Electrical, Software, Physics, Mechanical, and Chemical Engineering. Therefore, students will have the opportunity to explore classes in all these specialties and become multidisciplinary.
- Secondly, the program is spread over 4 years (or 5 if you want to have fewer classes per semester), which includes 1 mandatory internship during the summer. The courses are in French, but some are available in English for Mobility students. To obtain your diploma, 120 credits must be completed, each class generally being 3 credits with a few exceptions. To be considered a full-time student, one must take between 12 and 15 credits per semester, equaling 4 or 5 classes. Essential information for European students, 1 credit in Montreal = 2 credits in Europe.
- The fall semester is from the end of August till the end of December (ex.2024: Aug. 26th to Dec. 20th) including the examination period, and the Winter Semester is from the beginning of January to the beginning of May (ex.2025: Jan. 8th to May 6th).

Typical course plan for 4 years in Biomedical Engineering at Polytechnique Montreal, taking 15 credits per semester. The internship is not included but represents 9 extra credits that you must do between 55 and 85 completed credits. In parenthesis, you will find the number of credits associated with each class.

Semester 1 (Fall)	Semester 2 (Winter)	Semester 3 (Fall)	Semester 4 (Winter)	Semester 5 (Fall)	Semester 6 (Winter)	Semester 7 (Fall)	Semester 8 (Winter)
Health and Safety Teaching Laboratories (0)	Electrical Circuits (3)	Continuum Mechanics (3)	Biomedical Instrumentation Project (3)	Molecular Statistical Thermodynamics (3)	Modeling and control in physiology (3)	Biomicrosystems (3)	Computer Networks (3)
Biochemistry for Engineers (3)	Biomedical Engineering Projects and Teamwork (4)	Biomedical Instrumentation and Measurements (3)	CAD/CAM for Biomedical and Rehabilitation Applications (3)	Regulation of Medical Devices (3)	Biomedical Imaging Principles (3)	Sociology of Technology (3)	Ethics in engineering (3)
Initial Communication Tests (0)	Molecular and Cellular Biology for Engineers (3)	Physiology, Systems and Technologies (3)	Modern Physics in Biomedical Engineering (3)	Digital Processing of Medical Images (3)	Biomaterials (3)	Integrative project in biomedical engineering (2) 1/2	Integrative project in biomedical engineering (4) 2/2
Procedural Programming in Python (3)	Written and Oral Communication Workshops (0)	Electromagnetic Fields (3)	Scientific Computing for Engineers (3)	Molecular and Cellular Biology Laboratory (3)	Individual Project in Biomedical Engineering (3)	Course of choice (3)	Course of choice (3)
Linear Algebra for Engineers (2)	Differential Equations (3)	Probability and Statistics (3)	Biomechanics (3)	Economics for Engineers (3)	Written and Oral Communication (1)	Course of choice (3)	Course of choice (3)
Calculus I (2)	Calculus II (2)				Immunity and Biomolecular Interactions (3)		
Materials (3)							
Mechanics for Engineers (3)							

### How many years

- 4-year bachelor's to have an engineering diploma
- Normal to do it in 4 ½ or 5 years, especially if you are getting involved in other committees at the same time and do 12 credits/semester instead of 15

### Optional and mandatory courses

All courses in the table are mandatory, but you have 12 credits that you can choose by selecting an orientation.

### Here are the different options:

- Medical Robotics: specialization in Strasbourg
- Clinical Engineering
- Human-Computer Interactions
- Emerging Technologies
- Sustainable Development
- Innovation and Technological Entrepreneurship
- Engineer Mathematics
- Management: DESS with HEC (Business School linked to University of Montreal like Polytechnique)
- International Projects

# MOBILITY PROGRAMS

People come from around the world to join us for one semester, 1 year, a master's program, a PhD, a double diploma, or even their full undergraduate studies:

- For more information: [International Thematic Clusters in Engineering](#)
- For Students applying in Undergraduate, Graduate and DESS programs: [sep-international@polymtl.ca](mailto:sep-international@polymtl.ca)
- For Exchange Students (short term mobility students): [etudiant.echange@polymtl.ca](mailto:etudiant.echange@polymtl.ca)

## Lifestyle in the Country

We are perceived as welcoming, smiling and open-minded and I really feel this reality in my day-to-day. Montreal is also a particularly inclusive city.

There is no beach or nearby city for friendly runaway weekends, but people often go hiking/walking in the forest or spend a few days in a cottage near a lake, since there are a lot as close as 30 min driving from Montreal.

People spend a lot of time outside: at parks in the Summer, and skiing in the Winter. Winter is cold (-10°C to -20°C), but it is often sunny so it isn't that bad.

Canada is quite materialistic compared to other countries in Europe. In the professional environment, it fits the American lifestyle (productive, effective) than in other countries where you enjoy life more and relax from time to time.

Quebec is a French-speaking Province in an Anglophone Country. Thus, please try to learn some French if you come to be more accepted, but know that everyone is bilingual and that you'll manage in English for sure.

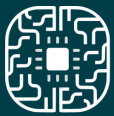




2024

# BREAKING GLOBAL FRONTIERS

BIOMEDICAL ENGINEERING  
AROUND THE WORLD



**ANEEB**  
Associação Nacional de Estudantes  
de Engenharia Biomédica



**APOLEB**  
PAR LES ÉLÈVES INGÉNIEURS DE POLYTECH LYON



**GUBSA**  
Griffith University  
Biomedical Student Association

