Universitat Pompeu Fabra Barcelona

Information Session for students of the BSc degree in Biomedical Engineering (GEBM)

Elective courses | Internships | Final year project (TFG) | Mobility

2024-2025

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General Information

Study Plan / Pla d'estudis:

- Basic courses / Assignatures bàsiques (64 credits)
- Core courses / Assignatures obligatòries (118 credits - **6 credits of mandatory internships**)
- Elective courses / Matèries optatives (**40 credits**)
- Final year project / TFG (**18 credits**)

Elective courses /Crèdits optatius:

- Optional subjects (= Elective courses) / Assignatures optatives
- Core subjects from other BSc studies of the School of Engineering / Assignatures obligatòries d'altres graus de l'Escola
- Internships in industry or academia / Pràctiques en empreses o a la universitat (**up to 9 credits**)
- Outgoing Mobility / Mobilitat fora UPF (**up to 30 credits**)
- Mobility UPF (Elective transversal education / Formació transversal de lliure elecció): https://www.upf.edu/web/formacio-transversal/
- Crèdits RAC (Reconeixement Acadèmic de Crèdits): https://www.upf.edu/web/upfparticipacio/oferta-activitats-credits i per títol de llengua estrangera: https://seuelectronica.upf.edu/normativa-de-reconeixement-academic-en-credits-per-aprenenta tge-de-llengues-en-els-estudis-de-grau

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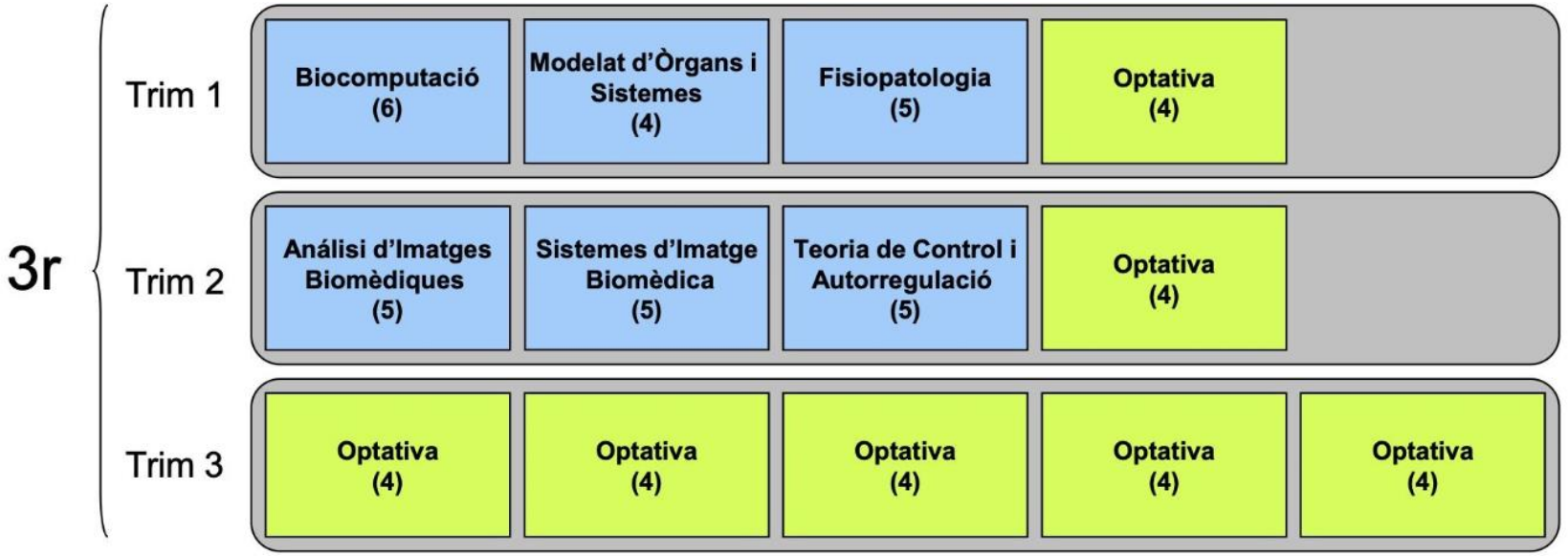
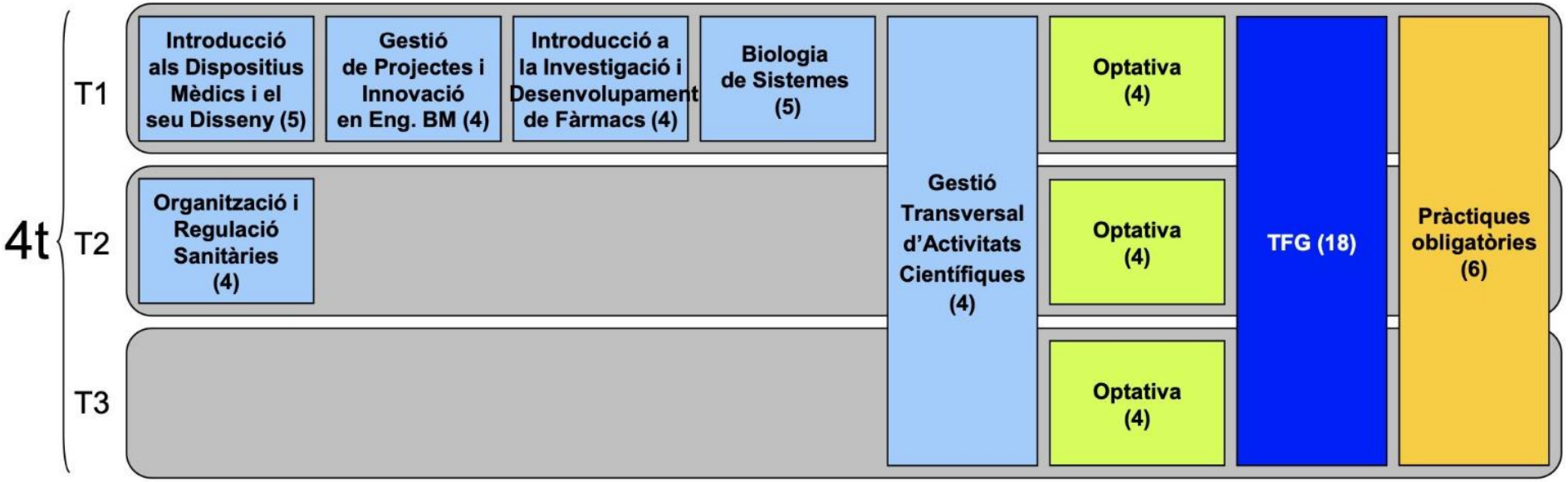
Syllabus 3rd and 4th years (2020-)





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Optional subjects GBEM

1st trimester

- **Microfluidics – new! – Up to 16 students only!**
- **Advanced synthetic biology (MELIS)**
- **Nanomedicine and Nanobiotechnology (MELIS)**
- **Clinical medicine Group 1 (MELIS, Hospital del Mar) – Up to 15 students only!**

2nd trimester

- **Advanced analysis of neuronal signals (DTIC)**
- **Machine learning for applications in biomedicine (DTIC)**
- **Advanced Modelling in Biomechanics & Systems Mechanobiology (DTIC)**

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Optional subjects GBEM

3rd trimester

- **Advanced analysis of biomedical images: Segmentation and Quantification (DTIC)**
- **Planning and guidance for minimally-invasive interventions (DTIC)**
- **Advanced Modelling in Biomechanics & Systems Mechanobiology – VPH Summer School (DTIC)**
- **Data Science and computational models in biomedicine (DTIC / MELIS)**
- **Computational neuroscience (DTIC/ MELIS)**
- **Clinical medicine Group 2 (MELIS, Hospital del Mar) – Up to 15 students only!**
- **iGEM (International Genetically Engineered Machine) bianual !!**

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Optional subjects from other UPF degrees

2nd trimester

- Gesture and face analysis (DTIC, Audiovisual systems)
- Synthetic images (DTIC, Computer science)

3rd trimester

- Neuroscience and Humanities (MELIS, human biology) – Up to 10 GEBM students
- Virology (MELIS, human biology)
- Genomics (MELIS, human biology)
- Developmental biology (MELIS, human biology)
- Genetics (MELIS, human biology)
- Computer vision (DTIC, Audiovisual systems)
- Innovation management (DTIC, Telematics)
- Three-dimensional vision (DTIC, Audiovisual systems)

To choose other optional subjects within UPF, see UPF Mobility

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Short descriptions of GEBM optional subjects

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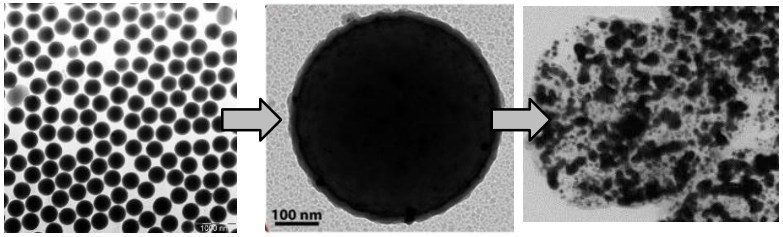
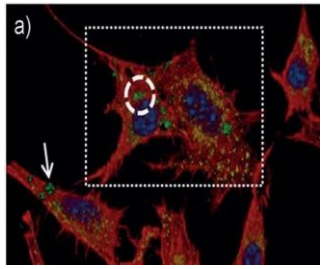
NANOMEDINE AND NANOTECHNOLOGY (1st TRIMESTER, ENGLISH)

Coordination: Pilar Rivera (MELIS) – pilar.rivera@upf.edu

The main goal of this subject is to present how biomedicine can benefit from nanotechnology

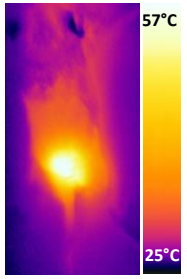


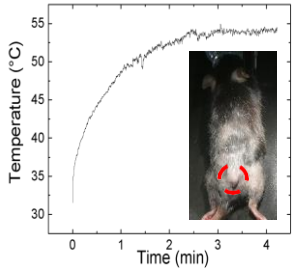
- **Fundamental concepts** on the hierarchical structure of the matter in the nanoscale.
- Synthesis of inorganic and organic nanoparticles and nanomedicines.
- Bio-physicochemical characterization techniques: nanotoxicity, spectroscopy, optical microscopy *in vitro* / *in vivo* biodistribution, pharmacokinetics.



- Medical applications: Nanotargeting, triggered drugs, controlled biosensing, therapy, imaging,hyperthermia, photodynamic

Lab classes will be devoted to perform experimental procedures in the Nanomedicine Lab at UPF





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ADVANCED SYNTHETIC BIOLOGY (1st TRIMESTER, ENGLISH)

Coordination: Marc Güell (MELIS) – marc.guell@upf.edu

General objectives

Synthetic Biology is an emerging field of research where scientists construct new biological systems and redesign existing ones. Emergent consequences of reinventing biology have already started to reach society. For example, engineered human immune T cells (CAR-T) cure cancers with outstanding performance, or 'ex vivo' gene therapy has successfully cured severe genetic diseases such as 'bubble boys', or sickle cell disease. Also, multiple non-medical applications have emerged. Genetically engineered salmons that grow faster, or 'CRISPR mushrooms' that rotten less have been developed. Perhaps even one day, synthetic biology may help in reviving extinguished species. Biological technology will have a growing influence in our lives.

Topics

- Technologies:
  - Gene synthesis / Advanced genetic engineering / Cell free systems / Elements of genetic circuits / Genome synthesis and refactoring / Directed evolution
- Applications:
  - Plant biotechnology / Medical biotechnology and gene therapy / Bioproduction
- Implications:
  - Bioethics / Bioindustry / Bioeconomy / Humans 2.0
- Exposure to multiple professional outcomes of synthetic biology: academic research, entrepreneurship/startup, industry, clinical research and practice

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ADVANCED ANALYSIS OF NEURONAL SIGNALS (2nd TRIMESTER, ENGLISH)

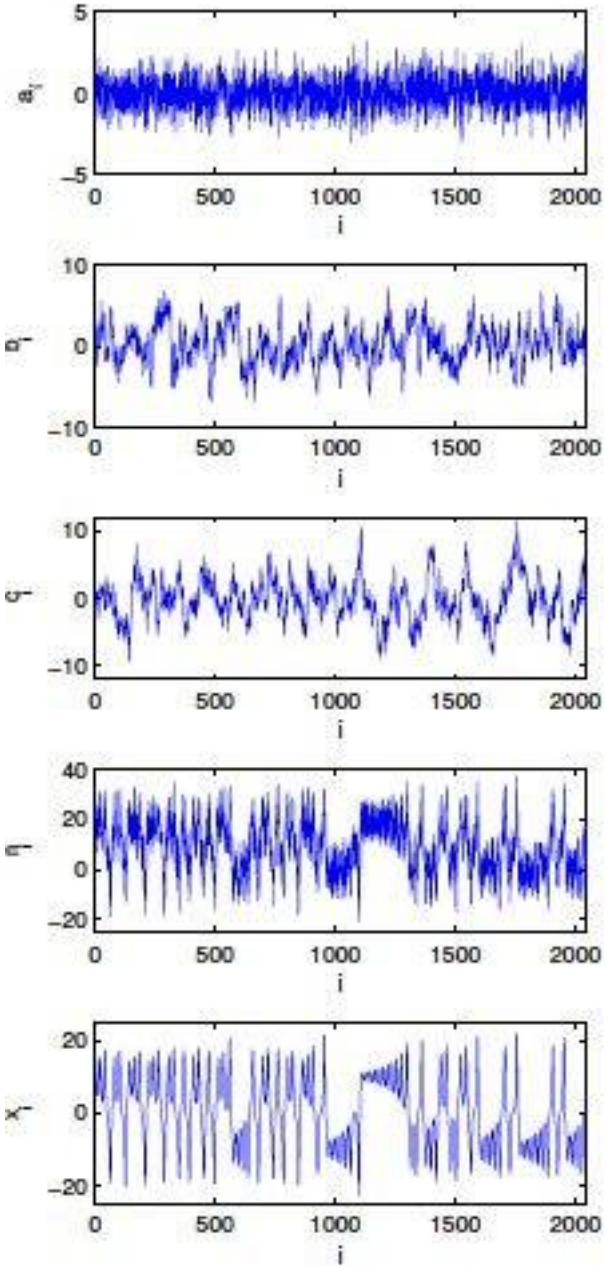
Coordination: Ralph G. Andrzejak (DTIC) – ralph.andrzejak@upf.edu

Nonlinear time series analysis

- Analyze experimental signals to characterize the underlying dynamics
- Detect non-random structure in signals
- Test null hypothesis about signals
- Signals: model signals, electroencephalogram
- Dynamics: model systems, brain

Approach

- Very strong emphasis on concrete examples to understand the theoretical concepts
- Analyze database of electroencephalographic signals from epilepsy patients (see http://ntsa.upf.edu/nonlinear-time-series-analysis-group)
- Matlab will be used in the theory, labs and seminars
- High degree of interaction in all sessions



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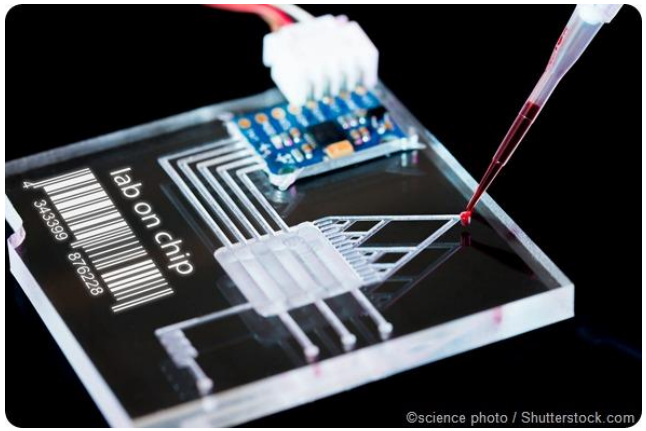
MICROFLUIDIS (1st TRIMESTER, ENGLISH)

Coordination: Kristina Hasse (EMBL)

WORK IN PROGRESS



The main goal of this subject is to present the techniques and potential applications of Microfluidics

- **Point-of-Care (POC) Diagnostics**: Microfluidic devices enable the development of fast and portable diagnostic systems that can be used directly at the point of care, such as in clinics and hospitals.
- **Cellular and Molecular Analysis**: Microfluidics is used for the precise manipulation of cells and molecules.
- **Organs-on-a-Chip and Tissues-on-a-Chip**
- **Controlled Drug Delivery Devices**
- **Stem Cell Research**: The ability to create chemical gradients and control the cellular microenvironment is essential for the study of stem cells and their differentiation.

Lab classes will be devoted to perform experimental procedures in the µFab Lab at PRBB

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ADVANCED ANALYSIS OF BIOMEDICAL IMAGES (3rd TRIMESTER, ENGLISH)

Coordination: Oscar Camara
(DTIC) – oscar.camara@upf.edu

The course covers **state-of-the-art techniques for biomedical image analysis** on real clinical applications (e.g. neuroimaging, cardiology, oncology) and all kind of medical images (e.g. X-ray, CT, MRI). Statistical atlases, Big Data analytics, radiomics, standard machine learning, **deep learning (DL)** and GAN techniques will be reviewed.
Note: Complementary subject to ML for Applications in Biomedicine (by R. Ramírez)

Seminars: tutorials in Python to get familiar with image analysis techniques

Imaging challenge project with DL techniques (50% mark): chosen by students to work during the whole trimester among available international imaging challenges (see https://grand-challenge.org). Past projects:

- Intra-cranial haemorrhage detection from CT scans
- Automatic evaluation of myocardial infarction from delayed-enhancement cardiac MRI
- Liver cancer segmentation in CT scans
- Identifying pneumothorax disease in chest X-rays
- Brain tumor segmentation from multimodal MRI

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Universitat Pompeu Fabra Barcelona
Department of Experimental and Health Sciences

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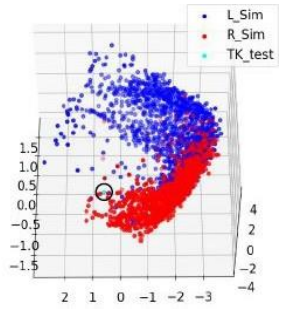
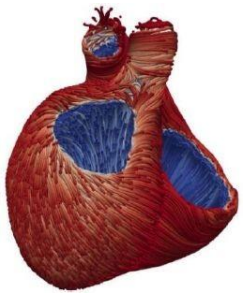
Department of Information and Communication Technologies

DATA SCIENCE AND COMPUTATIONAL MODELS IN BIOMEDICINE (COMPBIOMED) (3rd TRIMESTER, ENGLISH)

Coordination: Oscar Camara (DTIC) – oscar.camara@upf.edu





CompBioMed

BSC Barcelona Supercomputing Center
Centro Nacional de Supercomputación

The course is the first inter-department (MELIS, DTIC) initiative at UPF to **integrate students from medicine, biology, (biomedical) engineering and data science** degrees around **computational techniques in biomedicine**. Basic concepts, adapted to the level of each student typology, will be given on **Data Science, Artificial Intelligence and Machine (Deep) Learning, Digital Twin, Visual Analytics and High-Performance Computing**.
The subject will be implemented in collaboration with the Barcelona Supercomputing Centre (BSC), which will facilitate the access to computational resources and is part of the CompBioMed European project (https://www.compbiomed.eu/)

Multi-disciplinary project (60% mark): The students will work together in **multi-disciplinary teams** leveraging the complementary skills from each discipline. Projects on cardiac/brain electrophysiology will be offered, but teams could propose alternative ones. Seminars will be used to present progress of the projects

Tutorials/labs: to get familiar on some computational biomedicine tools

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PLANNING AND GUIDANCE FOR MINIMALLY-INVASIVE INTERVENTIONS (3rd TRIMESTER, ENGLISH)

Coordination: Miguel Ángel González Ballester (DTIC) – ma.gonzalez@upf.edu

We will study the general architecture and implementation aspects of computer-assisted surgery, from planning and simulation to intraoperative navigation and surgical robotics. We will analyse several existing systems, also from the point of view of clinical applications.

Topics

- Planning of pre-operative trajectories and structures
- Registration of pre-operative and intra-operative images
- Tracking of surgical instrumentation
- Augmented reality
- Biomechanical deformation models
- Applications in neuroradiology, neurosurgery, orthopaedics, hyperthermic ablations, endoscopy, among others

In labs sessions, students will become familiar to open-source libraries covering several topics in computer-assisted surgery.

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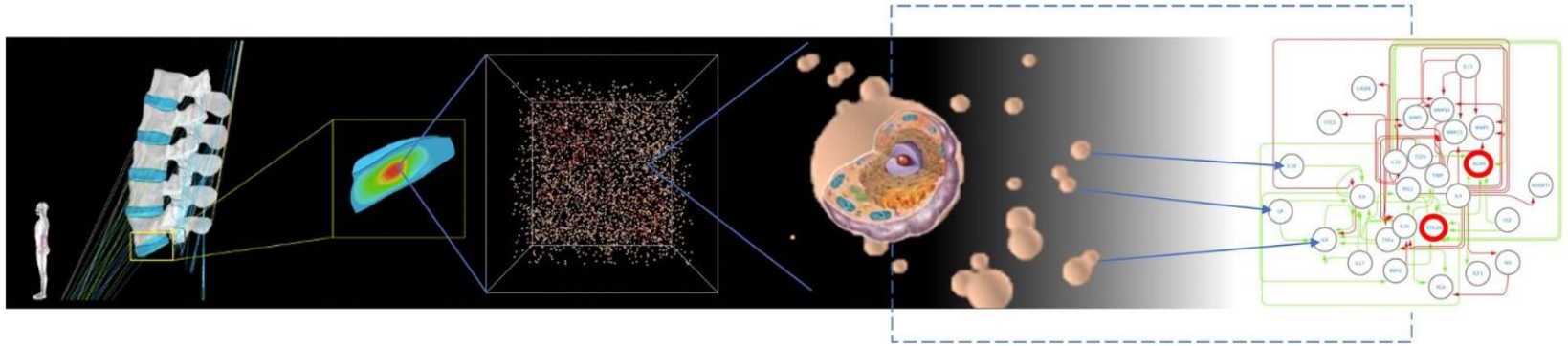
ADVANCED MODELLING IN BIOMECHANICS & SYSTEMS BIOLOGY (2n-3rd TRIMESTER, ENGLISH) - Coordination: Jérôme Noailly (DTIC) – jerome.noailly@upf.edu

Technological needs for models & simulations and interpretation thereof, for the exploration of **load-bearing systems at different scales** in health and disease



Topics

- Mechanobiology & Mechanotransduction
- Nonlinear & Multiphysics constitutive tissue modelling
- Nonlinear finite element (FE) modelling
- Network modelling
- Agent-based (AB) modelling
- Model calibration & validation
- Clinical Seminars

Theoretical sessions & tutorized hands-ons; Advanced use of FE & computational biology approaches. Research seminars & hands-ons integrated with the VPH Summer School

VPH Institute
Building the Virtual Physiological Human

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MACHINE LEARNING FOR APPLICATIONS IN BIOMEDICINE (3rd TRIMESTER, ENGLISH)

Coordination: Rafael Ramirez (DTIC) – rafael.ramirez@upf.edu

This course introduces the theory and practice of solving problems with machine learning techniques. Special emphasis is given to problems in biomedicine

Topics

- Supervised and unsupervised learning
- Dimensionality reduction
- Linear/logistic regression
- Decision trees
- Instance-based learning
- Neural networks and deep learning

Hands-on practical work based on Matlab/Python to conduct an end-to-end machine learning project

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COMPUTATIONAL NEUROSCIENCE (3rd TRIMESTER, ENGLISH)

Professors: Rubén Moreno (DTIC), Jordi García-Ojalvo (MELIS) –
ruben.moreno@upf.edu; jordi.g.ojalvo@upf.edu

The overall goal of the subject is to gain fundamental insights into brain function and the neural mechanisms underlying such function. To this end, theoretical and computational tools will be presented, which largely rely on the theory of dynamical systems. The behaviour of the nervous system will be considered at different levels of complexity ranging from the neuronal level to the system level in which biophysically plausible networks of neurons will be studied.

Topics
- Neurons
- Synapses
- Mean-field approximation
- Network level

Hands-on practical work based on Matlab and Python to perform computational analysis of real neuronal data.

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CLINICAL MEDICINE (1st or 3rd TRIMESTER, ENGLISH)

Coordination: Luisa Sorlí (MELIS) – luisa.sorli@upf.edu

In this subject the student will put into practice in a real clinical environment the skills and knowledge acquired during the degree. For this, a deep understanding of the main medical pathologies and the available technology for their diagnostic and treatment in clinical routine is needed. Different medical and surgical specializations will be targeted.

- Practical sessions (60% of the subject) will consist on visits to different services at Hospital del Mar

- Students will develop an individual project to create or improve any of the devices/technology currently used in clinical routine. Poster sessions will also be organized.

- Only 15 students (priority for 4th year students and best grades)

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iGEM (3rd TRIMESTER, ENGLISH)

Coordination: Javier Macia, Marc Güell (MELIS) –
javier.macia@upf.edu; marc.guell@upf.edu

- iGEM sets the standard in synthetic biology with standardized parts. Learn more about the open source technology and browse through 20,000+ standardized genetic parts in the **iGEM Registry**
- The International Genetically Engineered Machine (iGEM) Foundation is an independent, non-profit organization dedicated to the advancement of synthetic biology, education and competition, and the development of an open community and collaboration.
- iGEM's biggest program is the **iGEM Competition**. The GEBM gives UPF students the opportunity to participate to the iGEM Competition and push the boundaries of synthetic biology by tackling everyday issues facing the world
- Multidisciplinary teams are selected work together to design, build, test, and measure a system of their own design using interchangeable biological parts and standard molecular biology techniques.
- Acceptance of students is limited and based on a previous selection process

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Elective courses – Practical information

Particularity of BME degree at UPF

- Many elective courses
- A lot of freedom
- Many decisions to make (Student proactivity is cornerstone)

Keep in mind that:

- Not perfect schedules: impossible to fully avoid overlaps especially for the optional subjects from other degrees
- Think of backup solutions if a specific optional course cannot be followed for any reason
- Over the years: non-critical overlaps, teacher/student flexibility
- Flexibility from secretariat on enrolment

Get as much information as you can from professors (teaching plans, etc.) and former students

Internships – Practical information

Internships can be done at any time during the academic year, in industry and/or academia. You just need to:

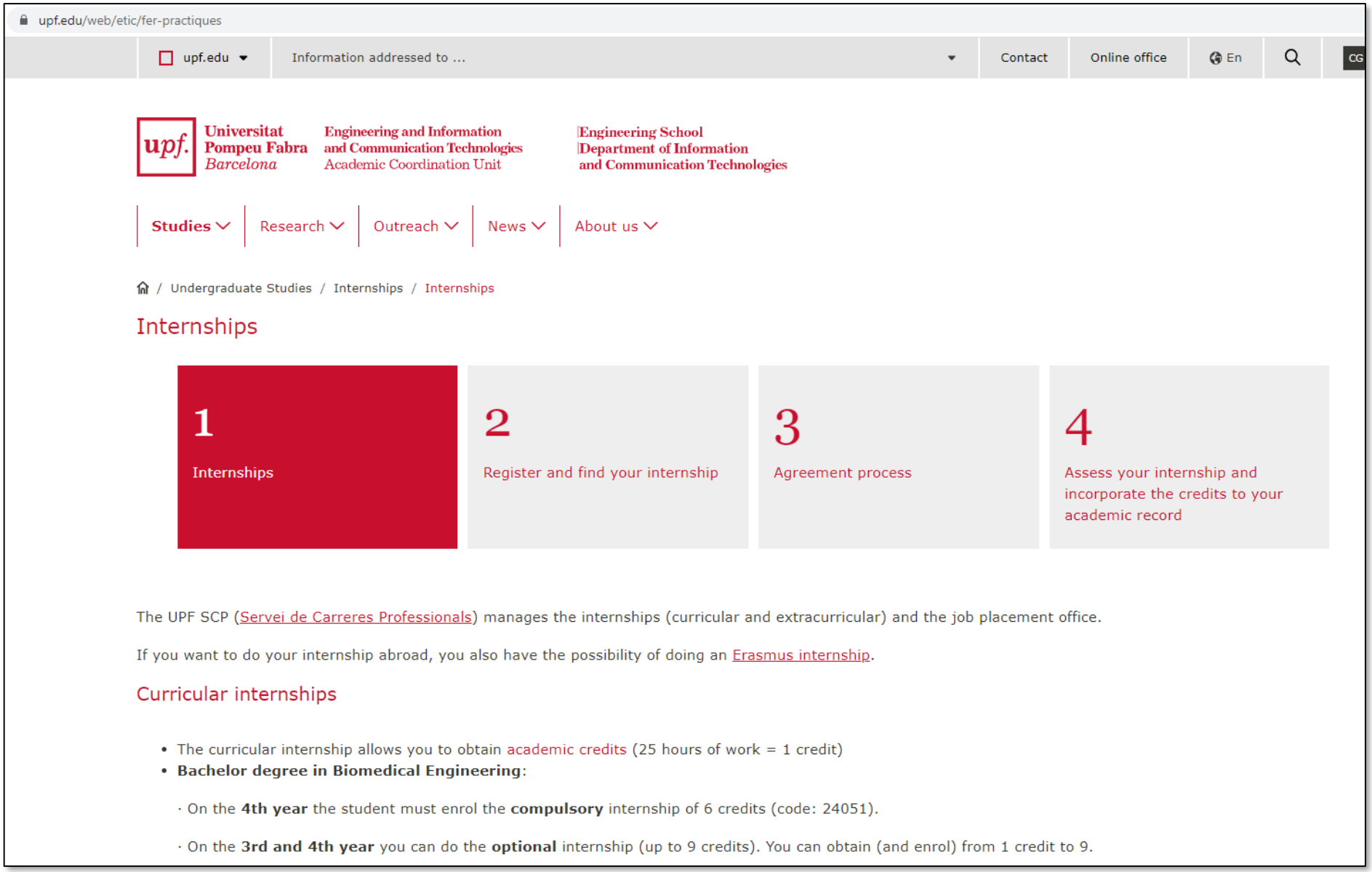
- Register to Campus Treball through Carreres Professionals and upload your CV – More information here
- Agree about the terms of the internship agreement with supervisors at the host institution: dates, number of hours per week, total number of hours (**defines the number of credits to be validated**), tasks
- Validate your credits by the end of the 3rd trimester at the latest. More information here

Keep in mind that:

- 25 h of internship ⇔ 1 ECTS
- In the GEBM, internships aim to provide students with relevant professional experience related to biomedical engineering
- Internship agreements need to be approved by the GEBM coordinator (Antoni Ivorra, DTIC)
- You will be evaluated by the supervisors at the host institution (behaviour, skills and competencies during the internship) and by GEBM coordinator (internship report)
- Internships require professional attitude and regular dedication (don't commit yourself if you have already too many obligations from other subjects)

Get in touch with Carreres Professionals to find companies of interest, check the offers on Campus Treball and talk to the GEBM professors and to former internship students

https://www.upf.edu/web/etic/fer-practiques



Internships – Practical information

EXTRACURRICULAR INTERNSHIPS

- Extracurricular internships will not be recognized with academic credits. These internships are voluntary and can be done at any time during the degree. They are not part of the curriculum, but they will add experience.
- You must be enrolled in a university degree in order to be able to do an extracurricular internship

WHERE CAN I DO AN INTERNSHIP?

- Internships can be done in an enterprise, academic or administrative unit, research group from the same university or institutions (national or foreign, both public and private).

WHEN CAN I DO THE INTERNSHIP?

- You can start the internship anytime during the year – but you need to have the agreement of educational cooperation before starting the internship, either if it is curricular or extracurricular.

HOW MANY HOURS DO I NEED TO DO?

- The dedication and schedule of your internship needs to be compatible with your studies.
- The agreement will finish before the start of the following academic year.

IF THIS IS MY FINAL YEAR, CAN I DO AN INTERNSHIP DURING THE SUMMER?

- If you finish your studies in July, you can still do an internship during the summer (until the beginning of the following academic year), as long as you do not apply for the official degree certificate.

Internships – Practical information

Companies that hosted two or more GEBM students during the academic years 2020-2021 and 2021-2022, (does not include universities and other public institutions such as research centers):

- ABLE HUMAN MOTION, S.L. (2)
- ACCORD HEALTHCARE SLU (2)
- Alma Medical Imaging (3)
- AMES Group Sintering (4)
- Azbil Telstar (8)
- Bitbrain(2)
- CONVATEC SL (4)
- Kerox Technology (2)
- New Born Solutions (2)
- Neuroelectrics (8)
- ROCHE DIAGNOSTICS, S.L. (3)
- Smith&Nephew (3)
- Sycai Technologies SL (4)
- TECNOLOGIA REGENERATIVA QREM (2)
- Werfen España (2)

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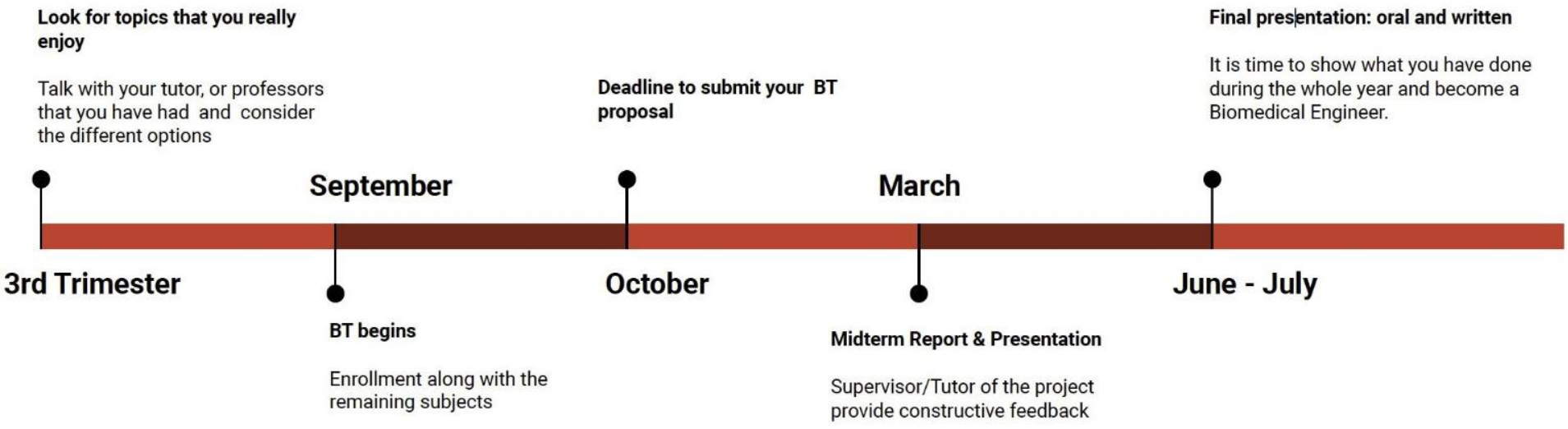
General info and tips for the final year projects (TFG)

Coordinator: Jérôme Noailly, DTIC (jerome.noailly@upf.edu)

Keep in mind:

- The TFG can be done at UPF or not, including abroad
- Start to think about your TFG **by the end of the 3rd course**: talk to professors, use previous experience of internship, contact companies, etc…
- Secure your TFG **by the 1st trimester of the 4th course** and prepare yourself for the 2nd trimester (ask for information, for initial data, read the relevant literature, ask for meetings)



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General info and tips for the final year projects (TFG)

Get started:

- General information & procedures: https://www.upf.edu/web/etic/enginyeria-biomedica-2016-informacio-estudiant
- Look for published TFG offers (**not exhaustive list of possibilities**): http://tfg.esup.upf.edu/tfg/pfc_consultar_pfcs.jsp?estudi=ebm
- Talk to the professors & **secure your desired positioning**: build your own project; clinical or industrial collaboration; get involved in ongoing research project; move abroad; …)
- To do your TFG in another institution, you need a UPF Tutor (who might not be supervising you)

During your TFG:

- Strictly respect the follow-up requirements and deadlines provided by the Coordinator
- **Work regularly**: continuous efforts are necessary to avoid /cope with last minute issues
- Request **regular follow-up meetings** with your supervisor(s): one meeting per week or every two weeks is not too much
- Timely inform your supervisors and/or UPF in case of problems (don't wait, time flies!)

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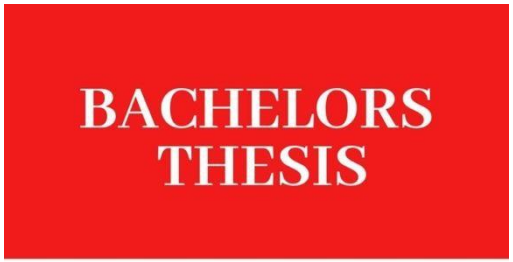
General info and tips for the final year projects (TFG)

TFG report and defence:



BIOMEDICAL ENGINEERING UPF

- TFG defences are an open event in the form of a scientific congress with limited presentation time (~ 15 min) plus questions & answers involving the jury and the attendees
- Reports and presentations must reflect your efforts and the quality of the work
- Reports must be well-written and well-structured, free of errors and clean – Check examples at the e-Repository: https://repositori.upf.edu/handle/10230/25277 - **Ask your supervisor(s)**
- Presentations must be visually clean, understandable by both experts & non-experts and remember… **Information is not communication!**
- Respect the timing for the presentation (rehearse, rehearse, rehearse)

"By failing to prepare, you are preparing to fail"

Benjamin Franklin

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General info and tips for the final year projects (TFG)

Most important take-home message:

General information & tips for mobility

Two types of mobility:

- UPF mobility: Opportunities in Cross disciplinary programmes (Minors | Free elective cross-disciplinary training | Barcelona International Summer School | Barcelona Programme for Interdisciplinary studies): https://www.upf.edu/web/programes-transversals/
- Outgoing mobility:
  - ❑ National: Programme SICUE - https://www.upf.edu/web/estudiarfora/estudiar-a-espanya
  - ❑ International (see below)

Outgoing mobility:

- How to prepare an Outgoing mobility:
  - ❑ Current destinations: https://www.upf.edu/documents/105229234/141094937/ESUP__2324.pdf/2274fa9c-9d3e-a68d-fd2a-0f9168f6d87b?t=1675862733433
  - ❑ Studying abroad UPF webpage: https://www.upf.edu/web/estudiarfora
  - ❑ Engineering School Mobility Webpage: https://www.upf.edu/en/web/etic/mobilitat
  - ❑ Erasmus Internships: https://www.upf.edu/web/carreres-professionals/erasmus-practiques

General information & tips for mobility

Outgoing mobility:

- Support & Contact:

  - ❑ Engineering School Coordinator: Jérôme Noailly, coord-mobility.etic@upf.edu
    Roles: Academic guidance for mobility; Validation of the Learning Agreements & requested equivalences; Evaluation of the academic results obtained during the mobility abroad

  - ❑ Engineering School Secretariat: Anna Gil, mobility.etic@upf.edu
    Roles: Eligibility rules; Administrative management of UPF learning agreements; Update of UPF transcripts according to academic results obtained during the mobility abroad

  - ❑ UPF Mobility and Welcome Office (OMA) Outgoing: https://cau.upf.edu/estudis
    (Contact only through CAU)
    Role: Requests for mobility & assignations; Contact & Communication with host universities abroad; Recipient of the academic transcripts from the host universities

International mobility for students with special needs by UPF Inclusion:
https://www.upf.edu/en/web/upfinclusio/mobilitat-internacional

General information & tips for mobility

Indicative schedule (based on 22-23 agenda)

/ Estudis / Estudiar fora / Estudiar a l'estranger / Com pots participar?

Com pots participar?

Calendari-resum de la convocatòria de mobilitat internacional

Fins el 25 de novembre	Acredita l'idioma
Del 14 al 18 de novembre	Participa als International Days i assisteix a les Sessions informatives per estudis

Information sessions!

Del 14 al 25 de novembre	Sol·licita les places d'intercanvi
Desembre	Estigues alerta a la publicació llistat provisional de sol·licituds admeses i excloses, a partir del qual s'obrirà un període d'al·legacions de 10 dies naturals.
Gener	Revisa la primera assignació de places
Febrer	Segona assignació de places (Reassignació). Si no tens plaça o estàs en participació condicionada, sol·licita de nou.
Març	Consulta l'assignació definitiva de places i accepta la plaça adjudicada. La UPF farà les nominacions a les universitat de destinació.
Març-Abril	Assisteix a les sessions informatives, on us informarem dels propers passos abans de marxar i les gestions per preparar l'estada a nivell pràctic i acadèmic
Maig-Juny	Consulta l'adjudicació d'ajuts, on us informarem de la documentació a cumplimentar

Information session!

General information & tips for mobility

Outgoing mobility:

Tips and facts:

- You might be interested in joining a university not already partner of UPF: talk to the coordinator of the GEBM and to the coordinator of Mobility in engineering (the administrative process for establishing new mobility agreements among universities takes at least one year)

- You **don't need any Erasmus agreement** for an internship or TFG abroad (although in that case you won't have a scholarship)

- The GEBM professors have a lot of international academic and industrial collaborators in many different fields. Seize the opportunity and ask for contacts.

Universitat Pompeu Fabra Barcelona

Acquire professional research experience in Biomedical Engineering @UPF

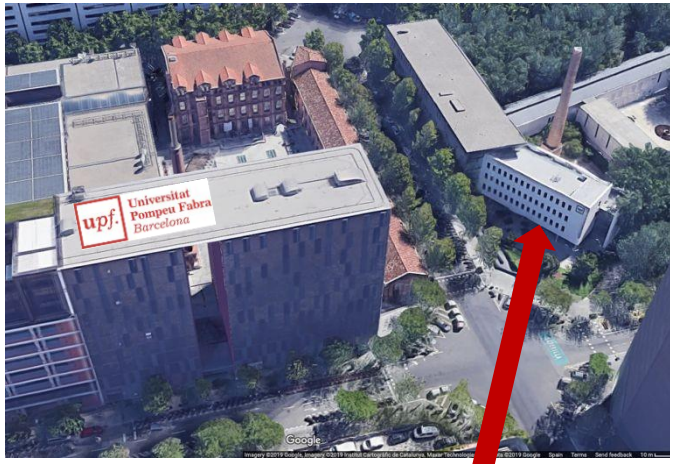
Universitat Pompeu Fabra Barcelona

Department of Information and Communication Technologies

Universitat Pompeu Fabra Barcelona

Department of Medicine and Life Sciences

Department of Information and Communication Technologies (DTIC) - BCN MedTech



Engineering School
Department of Information
and Communication Technologies

ANDRZEJAK, RALPH GREGOR
Biomedical Signal Processing

BIJNENS, BART H
Computational Cardiology

IDIBAPS

CAMARA REY, OSCAR
Physiological modelling

GONZALEZ BALLESTER, MIGUEL ANGEL
Computer Assited Surgery

IVORRA CANO, ANTONIO
Biomedical Electronics

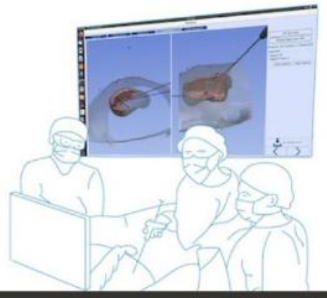
NOAILLY, JÉRÔME BERNARD
Biomechanics and Mechanobiology

PIELLA FENOY, GEMA
Medical Image Analysis

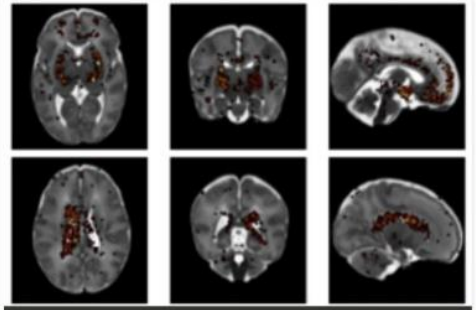
BCN MEDTECH

Universitat Pompeu Fabra Barcelona

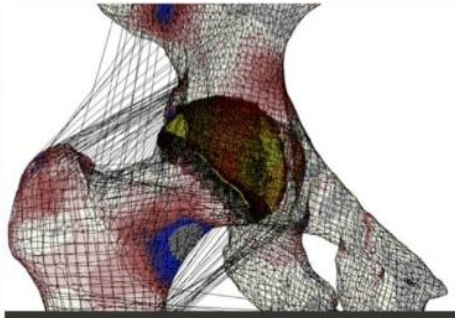
BCN MEDTECH



Computer Assisted Surgery



Medical Image Analysis

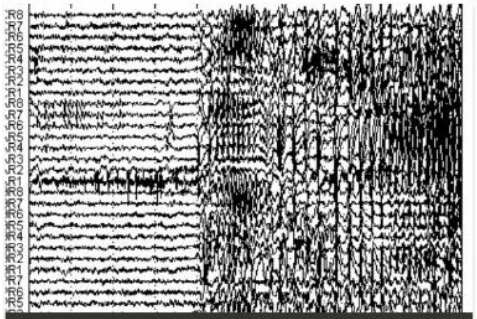


Biomechanics and Mechanobiology

SIMBIOSys (M.A González Ballester, G. Piella, J. Noailly)

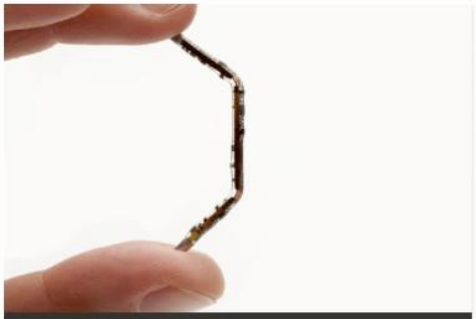
Physiological Modelling

Physense (O. Camara)



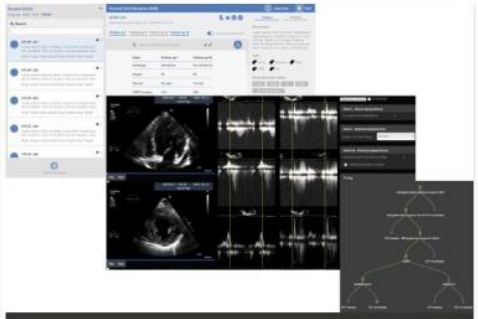
Biomedical Signal Processing

NTSA (R. Andrzejak)

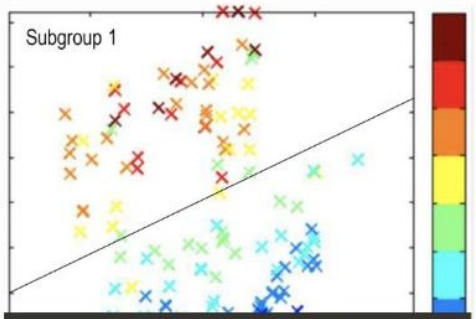


Biomedical Electronics

BERG (A. Ivorra)



Biomedical Data Handling



Machine learning for personalised medicine

Transversal

Universitat Pompeu Fabra Barcelona

Clinical collaborations

- Hospital Clínic de Barcelona
- Hospital Universitari Vall d'Hebron
- Brigham and women's hospital
- Cetir ASCIRES
- Fetal Medicine Barcelona
- CELLEX Foundation
- Hospital Sant Joan de Déu
- INRIA
- St George's Hospital
- Hospital de la Santa Creu i Sant Pau
- Althaia
- Cardiology Care for Children
- Centre Hospitalier Universitaire de Caen
- German Center for Neurodegenerative Diseases
- Atos
- University Hospital of Wales
- Hospital Universitario Virgen del Rocío
- IDIBAPS
- Harvard Medical School
- Utrecht Medical Centre
- IMIM
- Hospital General Universitario Gregorio Marañón
- Hospital Clínico Universitario Lozano Blesa
- …

Industry & Research Centre collaborations

- Philips Research
- Toshiba Medical Systems
- Indra
- Materialise
- Galgo Medical
- Brainlab
- Alma Medical Imaging
- Eurecat
- Instituto Gustave Roussy
- Eresa
- MED-EL
- Institute for Bioengineering of Catalonia
- Institute of photonic sciences
- Barcelona Supercomputing Center
- CIMNE
- Fundacion Pasqual Maragall
- Basque Center for Applied Mathematics
- QUIBIM
- SIMULA
- SIEMENS
- Everis
- ISGlobal
- Fundación QUAES
- …

https://www.upf.edu/web/bcn-medtech/

Universitat Pompeu Fabra Barcelona

Department of Medicine and Life Sciences (MELIS)

The UPF-MELIS centre is located at the **Barcelona Biomedical Research Park** (Parc de Recerca Biomèdica de Barcelona - PRBB) and includes a large number of research groups organized into the following research programs:

- Cell and Molecular Biology
- Molecular Medicine Program
- Evolutionary Biology and Complex Systems
- Biomedical Informatics
- Genetics and Neurosciences
- **Systems Bioengineering**

Department of Medicine and Life Sciences (MELIS)

Alliances and Collaborations

MELIS has made a big effort to establish important strategic alliances with surrounding research institutes affiliated to the UPF such as:

- Barcelona Institute for Global Health (IS Global)
- Centre for Genomic Regulation (CRG)
- Hospital del Mar Medical Research Institute (IMIM)
- Institute of Evolutionary Biology (IBE)
- Pasqual Maragall Foundation (FPM)
- European Molecular Biology Laboratory (EMBL)

These alliances have allowed us to increase the scientific critical mass of scientists in several areas of research with some of our Faculty members performing their research in these institutes.

Universitat Pompeu Fabra Barcelona

Department of Medicine and Life Sciences (MELIS)

Funding and Scientific Production

Substantial external funding from:

- competitive sources
- research contracts with industry

over **10 million Euros per year**.

The number of scientific articles produced by the MELIS has been **increasing to a total of more than 1,000 articles in last 5 years**.