

## “Improvements in Education Quality and Innovative applications in Biomedicine”

### Abstract

The course will present a global view of some of the new learning tools and methodologies that are currently being used in teaching Engineering. The participant will have the opportunity to get a glimpse of the quality level assurance in the University and its importance to guarantee quality teaching in Engineering.

Finally, the course will show some of the contributions that are being implemented in Biomedicine, both from Systems Engineering and Automatization and Bioengineering perspectives, in Universidad Carlos III de Madrid.

Monday 26/11/2018	9:30-11:00
<b>Electronic Systems and Automatic</b> <b>Alvaro Castro</b>	
<b>Title:</b> Robots for elders	
<b>Abstract:</b>  The unceasing aging of the population in developed countries is leading advanced societies to new problems that are not solved yet. It is expected that, in a near future, health care systems will struggle to provide the proper services to the growing population of seniors, mainly due to the limited economic resources and the shortfall of qualified worker. The rise of social robots represents an interesting opportunity to ameliorate the economic burden for health care systems and to extend the independent living of older adults. This talk will review the main robotic applications focused on the elders and, in particular, we will detail the robot Mini (developed in the UC3M) and its applications.	

Monday 26/11/2018	11:30-13:00
<b>Electronic Systems and Automatic</b> <b>Luis Enrique Moreno</b>	
<b>Title:</b> Exoskeletons, prosthesis and rehabilitation robotics	
<b>Abstract:</b> The talk will be about the state of the art and possibilities of robotics in different rehabilitation and assistive aspects related with upper and lower limbs problems. It will cover exoskeletons for upper and lower limbs, prosthesis for upper and lower limbs and some rehabilitation robots.	

Tuesday 27/11/2018	9:00-10:30
<b>David Pérez</b> <b>Bioengineering and Aerospace Engineering Department</b>	
<b>Title:</b> Bioengineering, from nanoscale to the service of medicine	
<b>Abstract:</b> Bioengineering is in a broad sense the interface of medicine and a wide range of engineering principles to understand, modify, or control living systems. From the ancient Greek when biosignals were sensed by doctors to the irruption of Nuclear Physics in the early 20th century which set the basis of the current imaging modalities such as X-Ray, Magnetic Resonance Imaging or Positron Emission Tomography, the interest has been focused on understanding the structures and functions of the body. The body has been already completely mapped whereas its the function, especially the brain, is still the last frontier.	

Tuesday 27/11/2018	11:00-12:30
<b>David García Mato</b> <b>Bioengineering and Aerospace Engineering Department</b>	
<b>Title:</b> Medical imaging techniques and applications	
<b>Abstract:</b> <p>Medical imaging refers to different technologies that are used to view the human body in order to diagnose, monitor, or treat medical conditions. The goal of this seminar is to provide students with a comprehensive understanding of processing techniques to obtain the maximum amount of information possible from medical images. An introduction to medical imaging modalities will be provided. This introduction will be followed by an overview of popular techniques such as filtering, segmentation, morphological processing and registration. Moreover, surgical navigation technologies will be also covered, and some examples of clinical applications will be shown. .</p>	

Wednesday 28/11/2018	9:00-10:30
<b>Vice dean of Quality</b> <b>Antonio de Castro</b>	
<b>Title:</b> An introduction to the Quality Assurance in the Spanish Higher Education System	
<b>Abstract:</b> <p>In this talk a vision of the Quality Assurance in the Spanish Universities will be presented. Involved institutions and committees, academic groups of interest, numeric indicators used to define the quality criteria are examples to be commented on the basis of the implementation of the quality system at Universidad Carlos III de Madrid</p>	

Wednesday 28/11/2018	11:00-12:30
<b>José Alfonso Artero Guerrero</b> <b>Mechanical Structures</b>	
<b>Title:</b> The use of 3D printing technology for educational enhanced learning: application to aerospace structures  <b>Abstract:</b>  The structure analysis is traditionally performed using analytical or numerical methodologies, but the use of experimental techniques is generally avoided due to the difficulties related to the manufacturing and the testing cost. Nevertheless, this drawback can be avoided with the use of 3D printing technology that can handle with complex geometries in an affordable way. Therefore, in this work, the acquisition of competences has been encouraged adding the experimental analysis to the analytical and numerical methodologies used in the subject.	

Thursday 29/11/2018	9:00-10:30
<b>Carlos Santiuste</b> <b>Mechanical Structures</b>	
<b>Title:</b> The use of flipped classroom to improve soft skills of engineering students  <b>Abstract:</b>  The development of new technologies allows the use of new pedagogical methodologies in the classroom, in this work a teaching methodology is presented combining online learning with collaborative work techniques in face-to-face teaching. This methodology has been implemented in the course "Elasticity and Strength of Materials" in the Bachelor Degree on Industrial Engineering. This study have involved 250 students and 6 teachers. The results of this work demonstrate that the students' academic results can be improved using the same evaluation system. Moreover, students improved their transversal competences and soft skills.	