

## Biomedical Engineering Education in Europe

**Biomedical Engineering** (BME) represents the application of engineering principles and design concepts to biology and medicine. It combines the design and problem solving skills of engineering with biological and medical sciences to improve healthcare diagnosis, monitoring and therapy.

Significant biomedical engineering applications include the development of various diagnostic and therapeutic medical devices ranging from clinical equipment to micro-implants, common imaging equipment such as MRIs and EEGs, regenerative tissue growth, pharmaceutical drugs and therapeutic biological.

As subdisciplines of the biomedical engineering it can be mentioned:

- Biomechatronics
- Biomaterials
- Biomechanics
- Bionics
- Genetic Engineering
- Clinical Engineering
- Medical Imaging
- Biomedical Electronics
- Orthopedic Bioengineering
- Rehabilitation engineering



Education in BME varies greatly around the world. Biomedical engineers and bioengineers require significant knowledge of both engineering and biology, and typically have a Master's or a Doctoral degree in BME.

Many engineering schools in Europe now have a Biomedical Engineering Department or Program, with offerings ranging from the undergraduate to doctoral levels. The BME programs at all levels are becoming more widespread, including the Bachelor of Science in Biomedical Engineering. The number of biomedical engineers is expected to rise as both a cause and effect of improvements in medical technology.

The BME education in Spain, Greece and Romania has some common characteristics: it is organised for all levels of academic education (undergraduate, graduate Master's level and PhD level), similar standards and professional competences for BME education are developed in all these countries, and incipient e-learning systems for BME education are implemented. However, there are also some differences, which are related mainly to the economic level of these countries and to the degree of cooperation between academia and hospitals.

More information on [www.ortho-eman.ro/results](http://www.ortho-eman.ro/results)

## E-learning in Biomedical Engineering Education

The rapid developments in the last years not only require a well-prepared work force but also rapidly adapting training programs. In this case, distance learning is a viable alternative, motivating the development of a number of web-based learning environments.

In this context there is also an increased need for e-learning methods, tools and platforms to be used in biomedical engineering education. This is also reflected in the number of European projects launched on this subject in the past few years.

As it is mentioned in numerous studies concerning BME education, the implementation of e-learning systems and platforms seems to be a promising and modern method which can lead to the improvement of training for biomedical engineers.

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## Needs assessment for e-learning in medical and bioengineering field

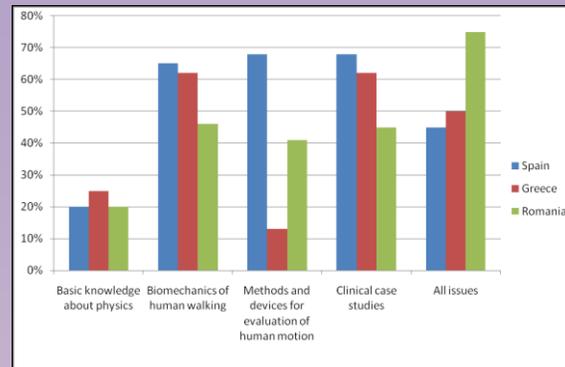
The main objective of this survey is to set the characteristics of the training course that will be developed during the **ORTHO-eMAN** project, and to evaluate the learning necessities in human motion investigation in orthopedics.

The report constitutes the point of departure for the integration and adaptation of the teaching contents that will be carried out during the second work package of the project.

The **specifics objectives** of the study have been:

- To know the socio-demographic and academic profile of the potential users of the learning platform.
- To identify the knowledge level at the job incorporation time and after some years of experience.
- To know if the formation received by these professionals was adequate.
- To value the possibility of carrying out a complementary formation.
- To identify the main learning areas for each profile.
- To provide information useful for the development of learning actions adapted to the necessities of the future students.

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The training interests for Spanish, Greek and Romanian residents and medical doctors

Data collection was done by auto-fulfilled questionnaire. Independent surveys were conducted for the four profiles defined of interest for the project development:

- Managers of medical departments;
- Academic medical staff;
- Medical residents and medical doctors;
- Engineers, bioengineers.

## Registration for ORTHO-eMAN

The process of registration for developed e-learning course is now open. If you want to register as a trainee for human motion analysis course, you can access the ORTHO-eMAN project website ([www.ortho-eman.ro](http://www.ortho-eman.ro)), Registration menu. You will receive information about the necessary steps to graduate this course. At the beginning of the year we will test the e-learning platform. Then we will inform you when the course will begin.

*The target group will be formed by residents, medical doctors in course of gaining competence especially in orthopedics and by engineers.*



## A web-based e-training platform for Extended Human Motion Investigation in Orthopedics

### ORTHO-eMAN

Project 2011-1-RO1-LEO05-15321  
Contract LLP-LdV/ToI/2011/RO/008

#### Partners:

- University of Craiova (Romania)
- National Center for Scientific Research "Demokritos" (Greece)
- Biomechanics Institute of Valencia (Spain)
- Clinical Emergency Hospital Bucharest (Romania)
- Democritus University of Thrace (Greece)

[www.ortho-eman.ro](http://www.ortho-eman.ro)

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