

Laboratorio di Tecnologie Biomediche *Introduzione*

Carmelo De Maria

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Course info

- Laboratorio di Tecnologie Biomediche (6 CFU)
- Part of the course Tecnologie Biomediche (12 CFU)
- Objective: Learning how to prototype medical devices, following international quality standards and using standard and advanced fabrication technologies



Teachers

- Carmelo De Maria and Giovanni Vozzi
 - Dpt. of Ingegneria dell'Informazione and Research Center E. Piaggio at University of Pisa
 - www.unipi.it , www.dii.unipi.it, www.centropiaggio.unipi.it
 - Research interests: Biofabrication, Additive Manufacturing, open source technologies in Biomedical Engineering
- Teaching assistant: Licia Di Pietro
 - PhD student in Information Engineering
 - Research on open source medical technologies
- Contact:
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 - dipietrolicia@gmail.com



Course info

- Prerequisites
 - Fundamentals in Math, Statistics, Physics, Chemistry, Material Science, Mechanics, Electronics, Computer Science
 - Computer skills: use of spreadsheets, slide show preparation

Course info

- Topics:
 - Medical devices: standards, regulations and design principles
 - Fundamentals of Manufacturing Engineering and Technology
 - Fundamentals of Computer Aided Design
 - Electronic and electromechanical rapid prototyping
 - Case studies

Course info

1M Biomedica						
	Lu	Ma	Me	Gi	Ve	Sa
8:30/9:30	Lab. tec. biomedica SI 1	Lab. prog. disp. elettrom. F4	Econ.e HTA SI 7	Mecc. appl. al sist. musc.schel. SI 5	Radiazioni elettrom. inter. biol. A13	
9:30/10:30	Lab. tec. biomedica SI 1	Lab. prog. disp. elettrom. F4	Econ.e HTA SI 7	Mecc. appl. al sist. musc.schel. SI 5	Radiazioni elettrom. inter. biol. A13	
10:30/11:30	Mecc. appl. al sist. musc.schel. F4	Analisi mod.segn.biomed. I A13	Bioinformatica B33	Mecc. appl. al sist. musc.schel. SI 5	Radiazioni elettrom. inter. biol. A13	
11:30/12:30	Mecc. appl. al sist. musc.schel. F4	Analisi mod.segn.biomed. I A13	Bioinformatica B33			
12:30/13:30				Bioinformatica SI 7		
13:30/14:30		Radiazioni elettrom. inter. biol. SI 1	Econ.e HTA SI 3	Bioinformatica SI 7		
14:30/15:30		Radiazioni elettrom. inter. biol. SI 1	Econ.e HTA SI 3	Bioinformatica SI 7	Lab. prog. disp. elettrom. ADH3	
15:30/16:30		Lab. tec. biomedica F2	Econ.e HTA SI 3	Analisi mod.segn.biomed. I SI 7	Lab. prog. disp. elettrom. ADH3	
16:30/17:30		Lab. tec. biomedica F2	Lab. tec. biomedica SI 3	Analisi mod.segn.biomed. I SI 7	Lab. prog. disp. elettrom. ADH3	
17:30/18:30			Lab. tec. biomedica SI 3	Analisi mod.segn.biomed. I SI 7	Lab. prog. disp. elettrom. ADH3	

Course info

- Teaching material:
 - Slides and notes, with free web resources provided by the lecturer:
 - <http://www.centropiaggio.unipi.it/course/laboratorio-di-tecnologie-biomediche>
 - <https://platform.ubora-biomedical.org>
 - The Biomedical Engineering Handbook - Joseph D. Bronzino, Donald R. Peterson
 - Online ISO and IEC databases

Course info

- Suggested Software
- CAD:
 - Fusion 360 (Autodesk),
 - FreeCAD (Open source alternative)
- CAM:
 - Fusion 360 (Autodesk)
- Electronic rapid prototyping:
 - Arduino (with Arduino 2 prototyping board)



Course info

- Final exam:
 - Prototype of a medical device
 - Explanation of physical principles
 - Identification of risk class according to Medical Device Regulation 2017/745 and of appropriate standards
 - Basic blueprints (mechanical, electronic, software)
 - Identification of fabrication technologies for prototyping and manufacturing
 - It will be a sort of “Device Dossier”
 - Technical document required by authorities to prove compliance to Safety and Performance Requirements of MDR 2017/745
- Group work is preferred (max 3)

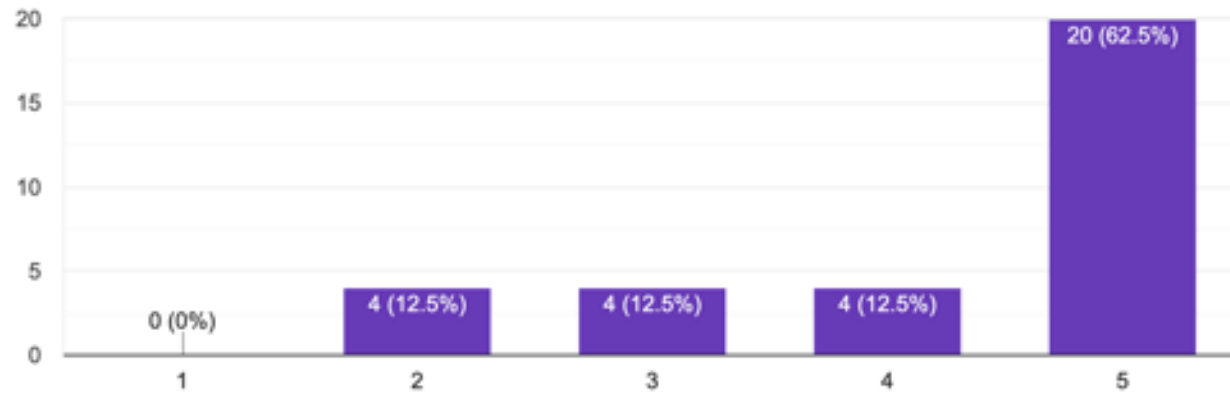
Course info

- Final exam:
 - Identify your device as soon as possible
 - [Mailing List and device list](#)
 - List of the past courses ([2017-18](#), [2018-19](#))
 - Revision(s) of the project before the exam:
 - (usually) it takes at 1 hour
 - (usually) more than 1 revision is needed
 - There is not a fixed day
 - Take an appointment by email (consider that we will have at least 30 groups, and time is limited)

Course info

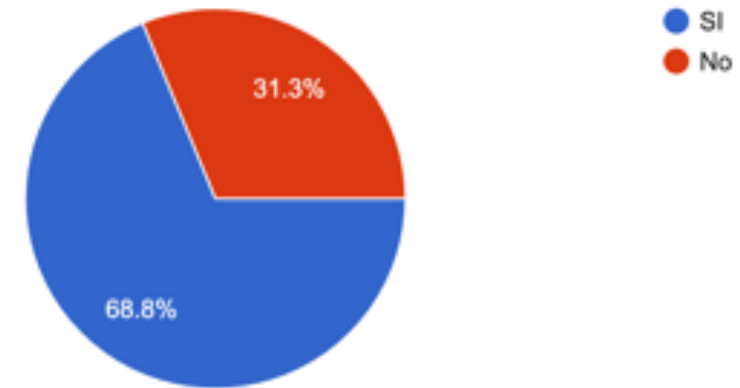
Ritieni un corso di questo tipo utile alla tua formazione

32 responses



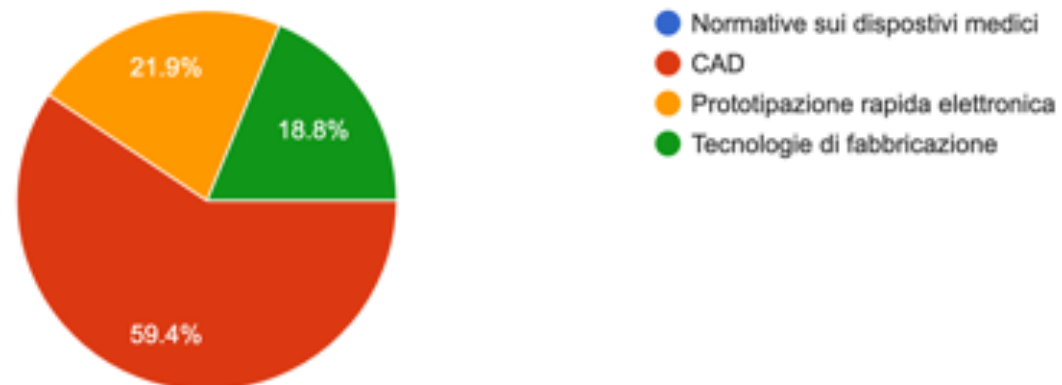
Seguiresti questo corso anche se fosse un "corso a scelta"?

32 responses



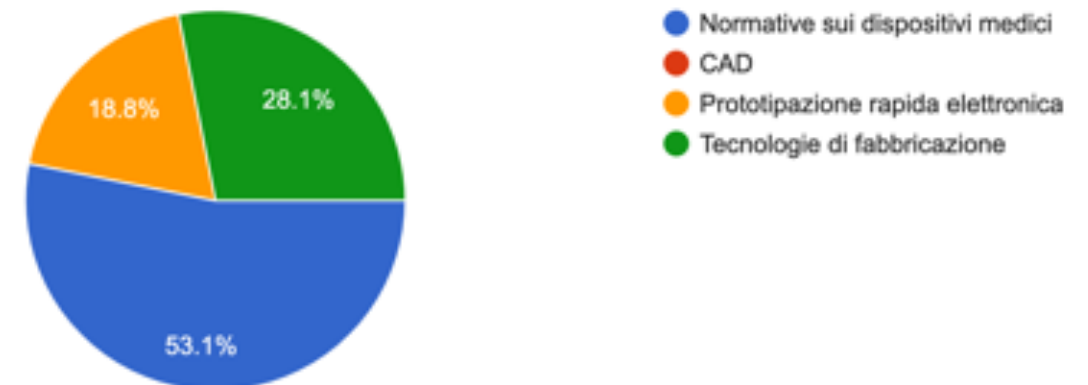
Qual è la parte del corso che reputi più interessante?

32 responses



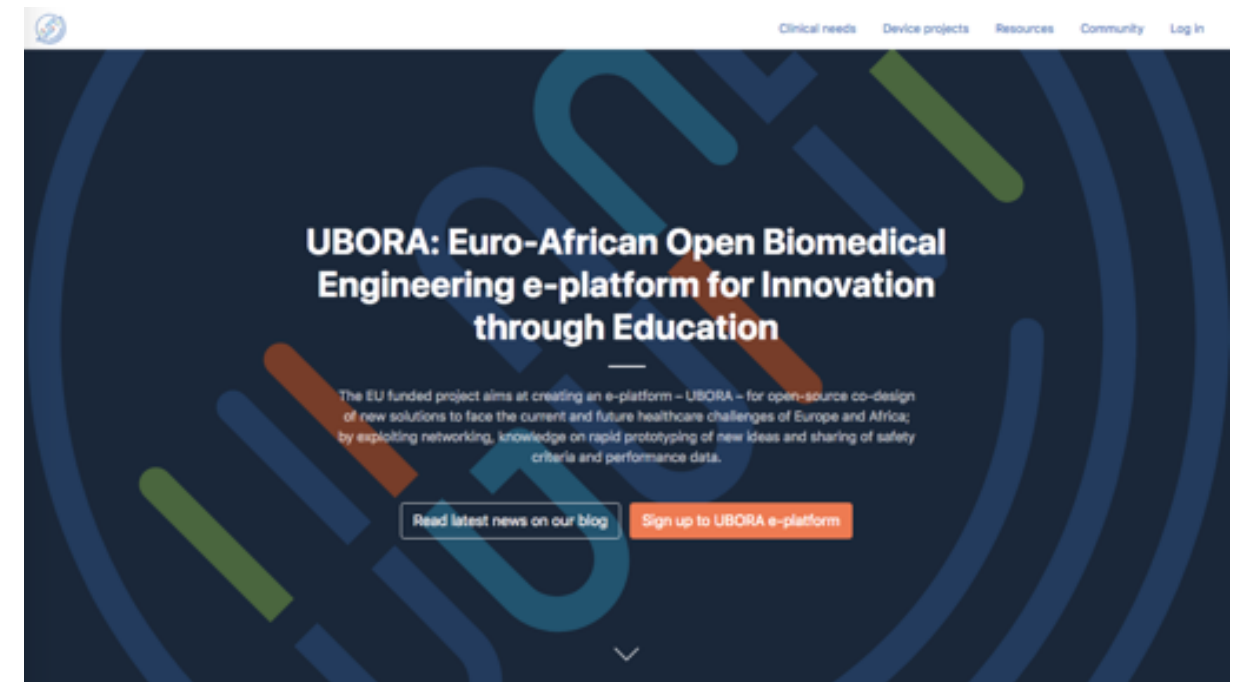
Quel è la parte che corso che reputi meno interessante

32 responses



Opportunity

- UBORA e-platform
 - <https://platform.ubora-biomedical.org>
 - Create a profile, create your projects,
 - Use it for your exam (not mandatory, but really helpful)



Grant Agreement no. 731053
Coordination and Support Action

Opportunity



- ABEC Design School
 - Uganda Industrial Research Institute, Kampala, Uganda, from 7^o to 11^o October 2019



**African Biomedical
Engineering Consortium**
Innovation through Education



Grant Agreement no. 731053
Coordination and Support Action

Opportunity



- UBORA info
 - www.ubora-biomedical.org
 - <https://platform.ubora-biomedical.org>

• @uborabiomedical



• UBORA



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