

# MASTER DEGREE IN MICROBIOLOGY



## INNOVATION, ENTREPRENEURSHIP AND TECHNOLOGY TRANSFER IN MICROBIOLOGY – Faculty of Sciences

### Objectives:

The main goals of this course are to incorporate the knowledge and concepts of the principles and methodologies of modern Technology Transfer. Thus, a taboo-breaking approach is initially pursued in order to discuss relevant topics in today's society such as innovation, intra- and inter-entrepreneurship, self-employment generation and professional and personal technical scientific and management tools. In parallel, a historical perspective of the evolution of these issues in Portuguese academic environment is also presented. Within this scope, comparison with more developed societies is also used both as a stimulus and a reference for concept consolidation. Learning is done via direct experimentation and K2B projects included in the syllabus are the election tool to achieve the overall objectives of the course.

### Program:

K2B TEAMS – learn by doing. Employment versus business. Entrepreneurship versus TTC. Economic valorization of technical-scientific knowledge. Industry versus University. Management and technical-scientific tools. Soft skills. Innovation and the process of new products' development. The process 'from bench to market'. Business Plan – the ultimate goal. Value proposition. Concept of value in exploitation / commercialization of new products. Assessment of the attractiveness of business opportunities. Protection of intellectual property / patents. Market Analysis. Vision and Mission. Action Plan: Objectives - assumptions - milestones. Skills and competencies. Business model. Value chain and segmentation. Financial projections. Risk versus benefits. Sources of capital: 3Fs, business angels, venture capital, banking. Business Plan - final decision. Pitching. The art of "convincing". The ability to sell a dream: individual Pitch - techniques for raising capital and customers.

### Evaluation methodology

The principal methodology used in this course is learning by doing. In addition, learning through dynamic studies of actual case studies (Harvard Business School case studies) will be used. In this methodology, students learn by performing in a real and direct way the process of technology transfer, using the tools of Innovation and Entrepreneurship as a vehicle for success. Students will be evaluated continuously by the results they show throughout the course. These results will be measurable mainly in the form of oral and written work, discussions and interventions in the classroom. Throughout the semester, and during the lessons of discipline, the following characteristics of students will also be continuously evaluated:

- a) ability to communicate clearly and concisely
- b) intervention and argumentative capacity
- c) demonstration of learning and skills' development
- d) assiduity

Approval for mark a 9.5 (0-20)

**Recommended bibliography:**

- \* Global Perspectives on Technology Transfer and Commercialization: Building Innovative Ecosystems ed. by JS Butler and DV Gibson. 2011. Edward Elgar Publ., USA.
- \* Timmons, JA & Spinelli, S. New Venture Creation – Entrepreneurship for the 21st Century. 8th Ed. 2009. McGraw-Hill, USA.
- \* Dorf, RC & Byers, TH. Technology Ventures: From Idea to Enterprise. 2nd Ed. 2008. McGraw-Hill Companies, USA.
- \* Stephan, PE. 1996. The Economics of Science. Journal Economic Literature, 34: 1199-1235.
- \* Azoulay, P, Dewatripoint, M and Stein, JC 2008. Academic freedom, Private-sector focus, and the Process of Innovation. RAND Journal of Economics, 39: 617-635.
- \* Verspagen, B. 2006. University Research, intellectual Property Rights and European innovation Systems. Journal Economic Surveys, 20: 607-632.
- \* Cohen, WM, RR Nelson and JP Walsh. 2002. Links and impacts: the influence of public research on Industrial R&D. Management Science, 48:1-23.
- \* Levin BR. 1996. Emerging Infectious Diseases 2: 93-102.
- \* Matic I et al. 1996. Trends Microbiol 4: 69-72.
- \* Matic I et al. 1997. Science 277: 1833-1834.
- \* Mayr E. 1991. One Long Argument - Charles Darwin and the Genesis of Modern Evolutionary Thought Penguin Books: London.
- \* Oliver A et al. 2000. Science 288: 1251-1254.
- \* Vulic M, Dionisio F, et al. 1997. PNAS 94: 9763-9767.