Programme: M. Sc. Biotechnology

Course Code: GBO-188 **Title of the Course:** Bioentrepreneurship

Number of Credits: 2

Effective from AY: 2019-2020

Prerequisites for the course:	No prerequisites required.	
Objective:	Research and business belong together and both are needed. In a rapidly developing life science industry, there is an urgent need for people who combine business knowledge with the understanding of science & technology. Bio-entrepreneurship, an interdisciplinary course, revolves around the central theme of how to manage and develop life science companies and projects. The objectives of this course are to teach students about concepts of entrepreneurship including identifying a winning business opportunity, gathering funding and launching a business, growing and nurturing the organization and harvesting the rewards.	
Content:	**MODULEI** Finance and Marketing Taking decision on starting a venture; Assessment of feasibility of a given venture/new venture; Approach a bank for a loan; Sources of financial assistance; Making a business proposal/Plan for seeking loans from financial institution and Banks; Funds from bank for capital expenditure and for working; Statutory and legal requirements for starting a company/venture; Budget planning and cash flow management; Negotiations/Strategy With financiers, bankers etc.; With government/law enforcement authorities; With companies/Institutions for technology transfer Assessment of market demand for potential product(s) of interest; Market conditions, segments; Prediction of	12 hours

	market changes; Identifying needs of customers including gaps in the market, packaging the product; Market linkages, branding issues; Developing distribution channels; Pricing/Policies/Competition; Promotion/ Advertising; Services Marketing Dispute resolution skills. **MODULE II** Fundamentals of Entrepreneurship Support mechanism for entrepreneurship in India Role of knowledge centre and R&D Knowledge centres like universities and research institutions; Role of technology and upgradation; Assessment of scale of development of Technology; Managing Technology Transfer; Regulations for transfer of foreign technologies; Technology transfer agencies. E-business setup, management. Human Resource Development (HRD) Leadership skills; Managerial skills; Organization structure, pros & cons of different structures; Team building, teamwork; Appraisal; Rewards in small scale set up. External environment/changes; Crisis/ Avoiding/Managing; Broader vision–Global thinking.	12 hours
Pedagogy:	lectures/ tutorials/assignments/self-study	
References/Readings	1. Adams, D. J., & Sparrow, J. C. (2008). Enterprise for Life Scientists: Developing Innovation and Entrepreneurship in the Biosciences. Bloxham: Scion. 2. Shimasaki, C. D. (2014). Biotechnology Entrepreneurship: Starting, Managing, and 3. Leading Biotech Companies. Amsterdam: Elsevier. Academic Press is an imprint of Elsevier. 4. Onetti, A., & Zucchella, A. Business Modeling for Life Science and Biotech 5. Companies: Creating Value and Competitive Advantage with the Milestone Bridge.Routledge. Jordan, J. F. (2014). Innovation, Commercialization, and Start-Ups in Life Sciences. London: CRC Press. 6. Desai, V. (2009). The Dynamics of Entrepreneurial Development and Management. New Delhi: Himalaya Pub. House. 7. Ramsey David (2011). Entre Leadership: 20 Years of Practical Business Wisdom from the Trenches. New	

	York: Howard Books 8. Byrne John A. (2011). World Changers: 25 Entrepreneurs Who Changed Business as We Knew it. New York: Penguin. 9. Lynn Jacquelyn (2007). The Entrepreneur's Almanac: Fascinating Figures, Fundamentals and Facts at your Fingertips. Canada: Entrepreneur Media Inc.	
Learning Outcomes	Students should be able to gain entrepreneurial skills, understand the various operations involved in venture creation, identify scope for entrepreneurship in biosciences and utilize the schemes promoted through knowledge centres and various agencies. The knowledge pertaining to management should also help students to be able to build up a strong network within the industry.	

Programme: M. Sc. Biotechnology

Course Code: GBO-189 **Title of the Course:** Cellular Biophysics

Number of Credits: 3

Effective from AY: 2019-2020

Prerequisites for the course:	No prerequisites required.	
Objective:	The course will provide 1) knowledge of the fundamental physical principles for the electrical properties of living cells and models describing membrane and action potentials. 2) an understanding of how potentials are generated across the membranes of cells and what these potentials do.	
Content:	**MODULE I** 1) Overview of the Cellular organization of the nervous system: • Typical nerve cell • Types of cells: Neuronal, Glial cells, ependymal cells and Schwann cells. • Classification and types of neurons , cytons and axons • Function of nerve cells 2) Ion Channels • Sodium channels	12 hours