



GUJARAT TECHNOLOGICAL UNIVERSITY
Integrated Master of Science (Biotechnology)

Semester: 6

Subject Name: Entrepreneurship & Intellectual Property Rights

Subject Code: 1360402

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
			ESE (E)	PA (M)	PA (I)	ESE (V)		
4	0	0	4	70	30	0	0	100

Prerequisite:

Students should have knowledge of applications of biotechnology and should have brief idea about marketing and management.

Rationale:

Research and business belong together both are needed. The objective of this course is to teach students about concepts of entrepreneurship including identifying a winning business opportunity, gathering funding and launching a business, growing and nurturing the organisation and harvesting rewards.

Course Content:

Unit No.	Content	No. of Hours	Weightage (%)
1	Innovation and entrepreneurship in bio-business Introduction and scope in Bio-entrepreneurship, Types of bio-industries and competitive dynamics between the sub-industries of the bio-sector (e.g. pharmaceuticals vs. Industrial biotech), Strategy and operations of bio-sector firms; Factors shaping opportunities for innovation and entrepreneurship in bio-sectors, and the business implications of those opportunities, Alternatives faced by emerging bio-firms and the relevant tools for strategic decision, Entrepreneurship development programs of public and private agencies (MSME, DBT, BIRAC, Make in India).	12	20
2	Bio markets: business strategy and marketing Negotiating the road from lab to the market (strategies and processes of negotiation with financiers, government and regulatory authorities), Pricing strategy, Challenges in marketing in bio business (market conditions & segments; developing distribution channels, the nature, analysis and management of customer needs), Basic contract principles, different types of agreement and contract terms typically found in joint venture and development agreements, Dispute resolution skills.	12	20
3	Technology management Technology – assessment, development & upgradation, Managing technology transfer, Quality control & transfer of foreign technologies, Knowledge centers and Technology transfer agencies, Understanding of regulatory compliances and procedures (CDSCO, NBA, GCP, GLA, GMP); Bi-	12	20



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	specific T-cell engagers (BiTEs) as artificial bispecific monoclonal antibodies for the use as anti-cancer drug.		
4	Nature of Intellectual Property Patents, Designs, Trade and Copyright. Process of Patenting and Development: technological research, innovation, patenting, development. International Scenario: International cooperation on Intellectual Property. Procedure for grants of patents, Patenting under PCT.	12	20
5	Patent Rights Scope of Patent Rights. Licensing and transfer of technology. Patent information and databases. Geographical Indications. New Developments in IPR: Administration of Patent System. New developments in IPR; IPR of Biological Systems, Computer Software etc. Traditional knowledge Case Studies, IPR and IITs.	12	20
Total Hours:		60	

Textbook:

1. Adams, D. J., & Sparrow, J. C., Enterprise for Life Scientists: Developing Innovation and Entrepreneurship in the Biosciences, Scion, Latest Edition
2. Shimasaki, C. D, Biotechnology Entrepreneurship: Starting, Managing, and Leading Biotech Companies, Routledge, Latest Edition
3. Ganguli, P. Intellectual Property Rights: Unleashing the Knowledge Economy Tata McGraw-Hill Pub, Latest Edition

Reference Books:

1. Jordan, J. F., Innovation, Commercialization, and Start-Ups in Life Sciences, CRC Press, Latest Edition

Course Outcomes:

No.	Course Outcomes	RBT Level*
1	Understand the nature and function of bioentrepreneurship in the successful, commercial application of innovation	UN,RM,AN,AP
2	A quality management team, adequate financing, and access to new technology that leads to products	UN,RM,AN,AP
3	Analyze different types of intellectual property rights in general and protection of products derived from biotechnology research and issues related to application and obtaining patents	UN,RM,AN,AP

*RM: Remember, UN: Understand, AP: Apply, AN: Analyze, EL: Evaluate, CR: Create

Suggested Course Practical List:

List of Laboratory/Learning Resources Required

https://onlinecourses.nptel.ac.in/noc20_hs66/preview