

Postgraduate Diploma in Biotechnology Entrepreneurship and Commercialization

Programme objectives

The main objective of this P G Diploma in Biotechnology Entrepreneurship programme is

- To provide quality training in multidisciplinary areas of Biotechnology and nurture students to meet the needs of the society and industry.
- To cater to the national and global requirement of trained manpower in the area of Biotechnology.
- To create and sustain excellent research and teaching ambience for future leaders and innovators.
- To train the students in technology-based entrepreneurship and Skill development for socio-economic development.

Programme Outcomes

The P G Diploma in Biotechnology Entrepreneurship programme is the present need of life science industries. Successful completion of this programme will result in students;

- Having strong foundation to learn cutting edge technology in the field of Biotechniques, Cell biology, molecular biology, Genetic Engineering, Plant, Animal and Microbial Biotechnology, microbiology, immunology, Food and Environmental Biotechnology and Bioinformatics.
- Having hands-on practical skills along with their respective theoretical knowledge, which will help in their research career in industries/start ups.

Pedagogies employed in the P G Diploma in Biotechnology Entrepreneurship programme

- Practical training in recent trends in Biotechniques.
- Individual hands on training in diverse areas of Biotechnology.
- Viva voce examinations of the students by examiners for improving their communication/expression skills.
- Special Lectures by eminent scientists/academicians.

Paper Code: BTEC 01 (Hard Core)
Title: Basics of Biotechnology Entrepreneurship

48hrs

Unit 1: An introduction to, Biotechnology for unmet market/societal needs Health Biotechnology: Helping to save and Extend Lives, Food and Agricultural Biotechnology: Helping to Feed the world, Industrial and environmental biotechnology: A Better way to make Things, The Public Policy Environment for Biotech Innovation. **4 hrs**

Unit 2: Basics of Start-up:

Risks of joining a Biotechnology Company, Genzyme in the Early Days, The Importance of Understanding Business and Finance, Raising Capital, Managing the Uncertainty of Biotechnology Core Values, Integrating the science and Business, The Value of a Business Background and Experience, Driven from within, In touch with Events outside the company, Good Fortune and Success, Company Formation, Ownership structure, and Securities Issue, EntityFormation,OwnershipStructure**8 hrs**

Unit 3:Biotechnology Entrepreneurship:

The Significance of the Biotechnology Entrepreneur, The Integration of two Distinctly Different Disciplines, Biotechnology Entrepreneurship versus General Entrepreneurship, Entrepreneurship and Intrapreneurship, The Biotechnology Entrepreneur, Manager, or Leader, Essential Biotechnology Entrepreneurial Characteristics, Being the Entrepreneur for a season, Driving Forces behind a Biotech Entrepreneur's Decisions, Learning from "Failure".

Unit 4: The Biotechnology Industry: An Engine of Innovation

The Birth of an Industry, The Industry Takes Root, The Industry Today, The Challenge of Drug Development, Falling R&D Productivity, The Consistent Challenge, Howdy Partner, The End of the Blockbuster Era, The Times they are a changing, Mapping the Human Genome, An Evolving Vision, Changing Economics, A Greater Promise, Investing in Innovation, Partnership of convenience, Promoting Technology Transfer, Not Just About Drugs, Everything Old is New Again, The Challenge of Scale, Improving Yields, The Challenge Today, The moment is now, Value is Transient, Value is Geographic Dependent Value is not a Function of Sales and Earnings, The Challenge for Life Sciences Companies.

Unit 5: Biotechnology Clusters and Incubators

Actively Developing clusters world -wide, Benefits of a Biotechnology Cluster, Essential Elements to Growing a Biotechnology Cluster in a Region, Important Consideration, Enhancers of Biotechnology Cluster Development, Maintenance Factors Vs Drivers, Inhibitors of Biotechnology Cluster Growth, The Role of Government in Developing Biotechnology Clusters.

BIRAC, Bangalore bio-innovation center and other incubators in India.

Paper Code: BTEC 02 (Hard Core)

48hrs

Title: Biotechnology Business Planning and Commercialization

Unit 1: Business Models and Business Plans

Different types of business models, models suitable for BioTechnology firms, which model is best for certain technologies, what is a business plan, building a business plan to support the model, establishing a Mission statement, Executive summary, Market analysis, Product descriptions, Proposed gearing, estimation, financials, Human resources, Intellectual property assessment, Entrepreneurs' role as a leader and risk manager, Critical analysis of case studies of important companies and entrepreneurs

Unit 2: Financing a startup

Valuation models for technologies and recognising its stage of development, types of financing options, what 'equity' and 'debt' financing mean, advantages and disadvantages of debt and equity options, financial gearing for the business model, various sources of finance, debt, Bootstrapping, Crowdfunding, Angel investors, Venture Capital, Incubators & Accelerators, Grants, Bank Loans, Business loans from Micro-Financing and NBFC (Non Banking Financial Corporations), Government programmes

Unit 3: Principles of Marketing

What is Marketing?, The Marketing Mix "4 P's" (Product, Price, Place and Promotion), 3 other P's (People, Positioning, Packaging), creating utility, types of utility (Form, Place, Time, Possession), Image utility, key features of biotechnology utility, the exchange process

Unit 4: Human Resource Management and its implications in Biotechnology

Introduction to Human Resource Management, establishing a suitable organisational structure, HR planning, Organisational culture, employee handbook, recruitment, selection process, strategies to acquiring skilled talent, managing careers, performance appraisals, continual monitoring, employee training and management development, compensation management, occupational safety and health, Grievance handling, disciplinary actions, trade unions, complexities in the biotech industry, technology & training, non-compete agreements, retention, Legalities

Unit 5: Commercializing Biotechnology

Proof of concept, SWOT (Strength, Weakness, Opportunity & Threat) Analysis, Intellectual property rights in various industries, patent search, patent protection path, the role of business model, Legal, licensing, Intra-firm cooperation, Mergers and Acquisitions, Clusters and its role, Clusters around the globe, clusters/industries within India, utilising clusters, access to funding in clusters, Critical analysis of Case studies, Exit Strategies

Paper Code: BTEC 03

48 hrs

Title: Biotechnology Market & Product Development

Unit 1: Biotechnology Products and their Customers: Development a Successful market strategy, Marketing, Develop a marketing strategy for your future product, Identify the patient, Identify the physician or Healthcare Provider, Identify the payers, Advancement of the Marketing Concepts, Market Research and Assessment Tools, Other Market Tools and Concepts, Starting to Develop a Market Strategy, Identify your market Development Milestones, Biotechnology Product Adoption Curve

Unit 2: Biotechnology Products Development:

Therapeutics Drug Development and Human Clinical Trails, Small molecules Drugs, Large Molecules Drugs, Clinical Transition Studies – Investigational New Drug Approval Clinical Trials, Development and Commercialization of In-Vitro Diagnostics: Applications for Companion Diagnostics, Bringing IVD Products to Market, Successful Adoption of IVDS, Reimbursement of IVD Products, Applications of an IVD as a companion Applications, Forging Diagnostic and Therapeutic partnership for companion Diagnostic Application Integrating an IVD Into the Drug Development pathway as a Companion, Diagnostics, Challenges to the Development and Commercialization of CDx Products, Future Applications for IVD Products.

Unit 3: Regulatory Approval and Compliances for Biotechnology Products

History of the FDA, Regulations Related to Biomedical Product Development Current Regulatory Pathways, Translational Development, Human Clinical Testing Phases, Biological License Application (BLA)

Unit 4: The Biomanufacturing of Biotechnology Products

The History of Biotechnology and Biomanufacturing, A Typical Biomanufacturing Process Biosimilars, Discovery, Process Development, Clinical Manufacturing, Clinical Trials Good Manufacturing Practices, Facility Requirements, The Biomanufacturing Team – Their Typical Roles and Responsibilities in a biologics Manufacturing Facility, Material anagement Biologics Drug Substance Manufacturing, Manufacturing Support Functions, Contract CMO) Versus In-House Manufacturing

Unit 5: Intellectual Property Protection Strategies for Biotechnology Innovations

The Intellectual Property Toolbox, Patents, Contracts relating to intellectual Property Joint Research Projects, Copyrights, Trademarks, Pharmaceutical patents and market, Exclusivity, Regulatory Approvals for Biologics and Biosimilars, Diagnostics and personalized medicine, Corporate IP Management, Patent Strategies and Product Lifecycle Management.

Unit 1:Introduction

What is valuation?, Profit/Equity Ratio, Discounted Cashflow Method, Asset Based Valuation method, Valuation models and its abstractness in BioTechnology/startup, Comparable Companies Method & its complexities, Free Cash Flow (FCF) Method & forecasting FCF, Product life cycle, assessing the biotechnology's stage in the product life cycle, regulatory approval process, Basic research stage, PreClinical stage, Clinical phases, Market assessment, SWOT (Strength, Weakness, Opportunity, Threat) analysis, Modelling for an appropriate exit strategy

Unit 2: Methods of funding

Estimating, Cost Control and escalations, how business model dictates funding options, two main instruments of funding a startup, Equity & Debt, their advantages and disadvantages, Implications of Equity and Debt on a startup and it's growth prospects, levels of risks and prospects of returns with each option, cost of raising capital, impact on Free Cash Flow and operatingcosts, Venture Debt, Intellectual property valuation

Unit 3: Early Stage Investments

Bootstrapping, achieving Proof of Concepts, leveraging retained equity, lean modelling, suitability analysis, Angel Investors, role of angels, managing expected returns, Incubators & accelerators, Grants, Major incubators in India, qualifying for grants

Unit 4: Crowdsourcing

The mechanics of crowdsourcing, structuring investors incentives, the international platform, introduction to major crowdsourcing services, cost of listing, importance of a social cause, forecasting payouts, managing an exit, critical analysis of case studies

Unit 5: Venture Capital

What is Venture Capital (VC)? Implication on the corporate structure and Free Cash Flow, Modelling for external investors, Growth strategy, Alphabet Rounds of Equity, Protecting Intellectual property, Legality, Intra-Company cooperation in BioTechnology, Strategic investors, Managing investor expectations, Corporate administration in India & Ministry or Corporate Affairs(MCA),later-stage venture debt

Unit 6: Exit Strategy

What is Exit Strategy?, Profit Target, Barriers to Exit, Licensing, Royalties in the BioTech sector transferring Intellectual Property, Legal procedure, Investor remuneration, Mergers & Acquisitions, Initial Public Offering (IPO, Stock Market Listing), Buyout, Liquidation, "Friendly" sale, Advantages and disadvantages of options,CriticalCasestudies

Tutorials: Student-teacher interaction and discussion

Paper Code: BTEC 04/2 (Soft Core)

48hrs

Title: Marketing Strategies

Unit 1: Principles of Marketing

What is Marketing?, the role of identifying needs from a BioTech perspective, creating utility, four forms of utility (Form, Place, Time, Possession), the exchange process, current market gaps in BioTech industries (emerging markets and clusters), The Marketing Mix (Product, Place, Price and Promotion), Case Studies in successful synergies

Unit 2: Marketing Management Process

Assessing marketing opportunities, Defining the market, Consumer assessment, Environmental assessment, Demand analysis and sales forecast, Identifying Market Segments and Selecting Target Markets, Selecting the most attractive segments, Developing marketing strategies, Positioning, Modification in the stages of product life cycle, Planning marketing programs, Designing Pricing Strategies, Selecting and Managing Marketing Channels & Distribution Systems, Managing marketing efforts, Organizing resources, Implementation, Monitoring and Control

Unit 3: Product Management

Introducing a new product or service, Sources for identifying a need, Innovation, Product life cycle and its management, four phases (Introduction, Growth, Maturity, Decline), Acquisition as New Product Development, role of researchers and consultants in Biotechnology, Idea generation and screening, Product Mix, product classifications and its considerations in a marketing plan

Unit 4: Branding

What is branding? Its importance in Biotechnology, Public Relations (PR) and its effect on brands, Brand perception, benefits to the retailer, manufacturer and the consumer, brand equity, value contribution to organization, Packaging and labelling, legal responsibilities and limitation, indirect communication with the consumer/client, Case studies to evaluate impact on biotechnology companies

Unit 5: Marketing & BioTechnology

Critical evaluation of Case Studies from various industries in the BioTechnology Sector

Tutorials: student-teacher interaction and discussion