



Online Course on

"INNOVATION AND ENTREPRENEURSHIP"

4th November to 23rd December, 2026.

Every Wednesday and Friday

Time: 1800 to 1900 hrs

Target students: Ph.D. students/Masters students/Industry Participants/
Faculty from Academic and Corporate Institutes/Entrepreneurs
Students desirous of attending the course have to register on Anuvidhya
Website (<https://anuvidhya.in>) before **4th November 2026.**

Credit	: 1 Credit
Course Coordinator	: Prof. Mahesh Subramanian, BARC (maheshs@barc.gov.in)
Course co-coordinator	: Dr Jyoti Kode (jkode92@gmail.com)
Duration of Course	: 15 hours (twice in a week/ 8 weeks)

Level /Program meant for: Ph.D. Health Sciences/Life Sciences

Post-graduate medical students, researchers in healthcare and biotechnology, and aspiring healthcare innovators.

Course outcome:

- Equip health science students with foundational knowledge of bringing innovation to entrepreneurship in healthcare.
- Foster creative problem-solving to address unmet needs in healthcare delivery and patient care.
- Develop skills for designing, validating, and commercializing Health-Tech innovations.
- Understand the ethical, regulatory, and business aspects of healthcare entrepreneurship and drug development.
- Introduce medical/health sciences students to the fundamentals of Intellectual Property Rights (IPR).
- Demonstrate the relevance of IPR in medical research, biotechnology, and pharmaceutical innovation.
- Cultivate an understanding of the ethical and societal implications of IPR in medicine

Mode of Evaluation:

1. **Class Participation:** MCQ (10%).
2. **Case Study Analysis:** Written analysis of healthcare innovation case studies (20%).
3. **Project Assignment:** Prototype development and presentation (40%).
4. **Pitching an Idea:** Evaluation based on innovation, feasibility, and impact (30%).

Lecturers:

1. Dr Jyoti Kode, Mumbai
2. Dr Ravi Rayanade, Mumbai
3. Dr Sudha Rao, Bangalore
4. Dr Raja Mugasimangalam, Bangalore
5. Dr Kaikhushru Parakh, Pune
6. Dr Vivek Varma, Mumbai
7. Dr Swarada P., Pune
8. Dr Muthu Dhandapani, Bangalore
9. Dr Meera Sharma, Gujarat
10. Dr Anita Joshi, Pune
11. Dr Rushikesh Patil, Gujarat

Session Plan:

Class Number	Date	Day	Time
1	04 November, 2026	Wednesday	6:00 PM – 7:00 PM
2	06 November, 2026	Friday	6:00 PM – 7:00 PM
3	11 November, 2026	Wednesday	6:00 PM – 7:00 PM
4	13 November, 2026	Friday	6:00 PM – 7:00 PM
5	18 November, 2026	Wednesday	6:00 PM – 7:00 PM
6	20 November, 2026	Friday	6:00 PM – 7:00 PM
7	25 November, 2026	Wednesday	6:00 PM – 7:00 PM
8	27 November, 2026	Friday	6:00 PM – 7:00 PM
9	02 December, 2026	Wednesday	6:00 PM – 7:00 PM
10	04 December, 2026	Friday	6:00 PM – 7:00 PM
11	09 December, 2026	Wednesday	6:00 PM – 7:00 PM
12	11 December, 2026	Friday	6:00 PM – 7:00 PM
13	16 December, 2026	Wednesday	6:00 PM – 7:00 PM
14	18 December, 2026	Friday	6:00 PM – 7:00 PM
15	23 December, 2026	Wednesday	6:00 PM – 7:00 PM

Week 1-2

1. Design and orient your research with clinical questions (**Dr Jyoti Kode, Mumbai**)
2. From Lab Bench to Boardroom: Startup Finance for Scientists (**Dr Ravi Rayanade, Mumbai**)
3. Bedside to Bench and Back: Translating your Research (**Dr Sudha Rao, Bangalore**)
4. How to start your entrepreneurial journey- A step by step guide (**Dr Raja Mugasimangalam, Bangalore**)

Week 3-4:

5. Development and validation of assays for regulatory compliant drug development process (**Dr Kaikhushru Parakh, Pune**)
6. Case study of translational research (**Dr Vivek Varma, Mumbai**)
7. Design thinking model of Innovation (**Dr Swarada P., Pune**)
8. Introduction of Intellectual Property Rights to basic researchers (**Dr Swarada P., Pune**)

Week 5-6:

9. Regulatory aspects of drug developments (**Dr Muthu Dhandapani, Bangalore**)

10. Guidelines for patent drafting and Ethical practices in IPR (**Dr Swarada P., Pune**)
11. IPR Management and technology transfer (**Dr Meera Sharma, Gujarat**)
12. Introduction to Innovation and entrepreneurship (**Dr Vivek Varma, Mumbai**)

Week 7-8:

13. Regulatory and legal considerations in healthcare innovations (**Dr Anita Joshi, Pune**)
14. Scaling in healthcare innovation (**Dr Rushikesh Patil, Gujarat**)
15. How does the entrepreneurial journey ends- as a professional business.
(**Dr Raja Mugasimangalam, Bangalore**)

Week 9-10:

1. **MCQ 10 questions with four options each Assessment**
2. **Case presentations (any of the above 4 topics)**
3. **Project Assignment:** Prototype development and presentation.
4. **Pitching an Idea:** Evaluation based on innovation, feasibility, and impact.

Syllabus and details of course:

Course Description:

This course plans to orient the mindset of target audience towards develop innovative products and explore entrepreneurship. This will be a foundation course module in alignment with recent initiative of Young India BHASKAR - Bharat Startup Knowledge Access Registry, to encourage, support and boost entrepreneurship and innovation in youth of India. Like BHASKAR, this event and consequent activities will provide a comprehensive platform for connection, knowledge sharing, and skill-building support, to empower aspiring entrepreneurs and associated stakeholders. Younger entrepreneurs tend to approach problems with greater creativity, which is crucial for fostering ground-breaking innovations. Starting early on the path of entrepreneurship and innovation is an invaluable choice that can significantly shape an individual's career and impact. This course will encourage young individuals not only gain a head start in honing essential skills but also maximize their ability to adapt and grow in competitive environments. Experienced and well-settled entrepreneurs will be mentoring students by sharing their journey, risk-taking abilities, thinking out of box attitude which will set up a culture for navigating those who wish to start young on the road to entrepreneurship. They will share secrets on how one can build robust networks, seek mentoring and also mentor younger generation to build up a team in making their own ventures successful. This course marks an early effort of TMC/DAE/HBNI and HBNI Institute Innovation Council (HIIC) to provide exposure to PhD students of Health Sciences about nitty-gritty of innovation and entrepreneurship early in their career to motivate them to experiment, refine their ideas, and adapt to market trends. Whether it's leveraging technology, exploring sustainable solutions, or addressing societal challenges, young entrepreneurs can take a longer-term view to innovate and create meaningful impact.

Course Objectives:

- Equip health science students with foundational knowledge of innovation and entrepreneurship in healthcare.
- Foster creative problem-solving to address unmet needs in healthcare delivery and patient care.
- Develop skills for designing, validating, and commercializing Health-Tech innovations.

- Understand the ethical, regulatory, and business aspects of healthcare entrepreneurship.
- Introduce medical/health sciences students to the fundamentals of Intellectual Property Rights (IPR).
- Demonstrate the relevance of IPR in medical research, biotechnology, and pharmaceutical innovation.
- Cultivate an understanding of the ethical and societal implications of IPR in medicine

Course Outline (in detail):

Week 1-2:

- 1. Design and orient your research with clinical question (Dr Jyoti Kode, Mumbai)**
 - a. The translational research gap
 - b. Aligning scientific curiosity with real-world healthcare needs
 - c. How to identify unmet clinical needs
 - d. Role of clinicians, patients, and healthcare systems
- 2. From Lab Bench to Boardroom: Startup Finance for Scientists (Dr Ravi Rayanade, Mumbai)**
 - a. Why This Matters
 - b. The Innovation-to-Market Pathway
 - c. Common Pitfalls for Scientist-Founders
 - d. Who Owns What?
 - e. Valuation & Dilution
 - f. Protecting Your Innovation
 - g. Fundraising Options
 - h. Questions Every Scientist Should Ask
 - i. Building the Right Team
 - j. Tools & Resources
 - k. Final Advice
- 3. Bedside to Bench and Back: Translating your Research (Dr Sudha Rao, Bangalore)**
 - a. Overview of the “bedside-to-bench-to-bedside” model
 - b. Differences between traditional and translational research pipelines
 - c. Importance of clinical relevance in biomedical discovery
 - d. Observations in clinical settings as research inspiration
 - e. Case examples of clinical dilemmas prompting lab investigations
 - f. Connecting clinical scenarios to underlying biological questions
 - g. Choosing appropriate disease models and study designs
 - h. Ethical considerations and feasibility
- 4. How to start your entrepreneurial journey- A step by step guide (Dr Raja Mugasimangalam, Bangalore)**

a. Start with observation and empathy b. Use problem-solution fit frameworks	c. Validate that the problem is worth solving (scale, impact, demand) d. Brainstorm multiple ideas
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- e. Evaluate feasibility, viability, and desirability
- f. Shortlist ideas using tools like SWOT analysis
- g. Understand the target audience
- h. Identify competitors and gaps
- i. Tools: surveys, interviews, secondary data
- j. Concept of MVP and rapid prototyping
- k. Collect user feedback
- l. Iterate based on insights

Week 3-4:

5. Development and validation of assays for regulatory compliant drug development (Dr Kaikhushru Parakh, Pune)

- a. Definition of assay
- b. Significance of assays
- c. Assay lifecycle
- d. Types and applications
- e. Fit-for-Purpose design
- f. Model selection
- g. Optimization
- h. Assay qualification and validation
- i. SOPs.
- j. Overview of regulatory bodies
- k. Guidelines: ICH Q2(R2)
- l. GLP & GMP

6. Case study of translational research (Dr Vivek Varma, Mumbai)

- a. *Example:* Development of mRNA vaccines / Imatinib (Gleevec) for CML / Cochlear Implants / AI-based diagnostic tool
- b. Background and unmet clinical need
- c. Research origin: Basic science discoveries
- d. Key stakeholders: Researchers, clinicians, institutions

7. Design thinking model of Innovation (Dr Swarada P., Pune)

- a. Design thinking for healthcare innovation: Empathize, Define, Ideate, Prototype, Test.
- b. Identifying clinical pain points and patient challenges.
- c. Tools for creative problem-solving (e.g., brainstorming, mind mapping).
- d. Case studies: Design thinking applied to a real-world clinical problem.
- e. Ideation exercise: Develop innovative ideas to improve patient outcomes

8. Introduction of Intellectual Property Rights to basic researchers (Dr Swarada P., Pune)

- a. Basics of IPR: patents, copyrights, trademarks, trade secrets.
- b. Importance of IPR in healthcare, medicine, and biotechnology.
- c. International IPR frameworks: TRIPS Agreement, WIPO, and patent treaties.
- d. Case study: Patents on life-saving drugs (e.g., antiretroviral therapies).
- e. Class discussion: The role of IPR in incentivizing innovation.

Week 5-6:

9. Regulatory aspects of drug developments (Dr Muthu Dhandapani, Bangalore)

- a. Regulatory strategy
- b. Quality management
- c. Risk assessment
- d. Roles and responsibilities

10. Guidelines for patent drafting and Ethical practices in IPR (Dr Swarada P., Pune)

- a. Importance of patent documentation in protecting innovation
- b. Overview of ethical responsibilities in IPR filing and prosecution
- c. Target audience: researchers, inventors, academicians, legal professionals
- d. Key components: Title, Abstract, Background, Summary, Detailed Description, Claims, Drawings
- e. Understanding independent vs. dependent claims
- f. Role of patent specification and legal language
- g. Real-world examples: fraudulent claims, ghost inventors, suppression of prior art
- h. Repercussions: rejections, legal penalties, loss of reputation
- i. Best practices drawn from landmark cases

11. IPR Management and technology transfer (Dr Meera Sharma, Gujarat)

- a. Definition of Technology Transfer
- b. Invention disclosure
- c. Invention evaluation criteria
- d. Inventorship
- e. Commercialization process- marketing/licensing
- f. Types of licenses
- g. Industry versus Academia
- h. Startups
- i. Current ways to derisk early tech

12. Introduction to Innovation and entrepreneurship (Dr Vivek Varma, Mumbai)

- a. What is innovation? What is entrepreneurship?
- b. Why these are critical in today's world — from job creation to solving global challenges
- c. Key differences between an inventor, innovator, and entrepreneur
- d. Product, process, business model, and service innovation
- e. Incremental vs. disruptive innovation
- f. Examples from sectors like healthcare, agriculture, technology, and education
- g. Creativity and problem-solving
- h. Risk-taking and resilience
- i. Leadership, decision-making, and adaptability
- j. Problem identification → idea generation → prototyping → validation → scaling
- k. Design thinking basics and user-centric innovation
- l. Role of incubators, accelerators, and mentorship
- m. Government and private sector support (e.g., Startup India, Atal Innovation Mission)
- n. Funding sources: seed grants, angel investors, venture capital

Week 7-8:

13. Regulatory and legal considerations in healthcare innovations (Dr Anita Joshi, Pune)

- a. Importance of regulatory and legal compliance in healthcare
- b. Overview of innovation-to-market pathway in healthcare
- c. Risk of non-compliance: legal, ethical, and patient safety implications
- d. Medical devices, diagnostics, biologics, and pharmaceuticals
- e. Regulatory classification systems (e.g., Class I, II, III devices) (this is applicable for medical devices)
- f. Examples of product types and their implications

- g. Medical devices regulatory bodies - India: CDSCO (Central Drugs Standard Control Organization), US: FDA (Food and Drug Administration), EU: EMA and MDR (Medical Device Regulation)
- h. Clinical trial requirements and approval stages
- i. Design controls and Good Manufacturing Practice (GMP) – Regulatory approvals pathways - 510(k), PMA (US), CE Marking (EU), Form MD (India)

14. Scaling in healthcare innovation (Dr Rushikesh Patil, Gujarat)

- a. Personal journey and motivation for healthcare innovation
- b. Current healthcare challenges in India and LMICs
- c. Defining “scaling” and “manufacturing” in the healthcare context
- d. From prototype to proof-of-concept to scalable solution
- e. Factors affecting scalability: technology, policy, partnerships
- f. Common bottlenecks and how to overcome them
- g. Centralized vs. decentralized models
- h. Public-private partnerships (PPP)
- i. Frugal innovation and local manufacturing
- j. Frameworks: Theory of Change, Logic Model, SDGs alignment
- k. Metrics: access, affordability, outcomes, equity

15. How does the entrepreneurial journey ends- as a professional business. (Dr Raja Mugasimangalam, Bangalore)

- a. Defining the entrepreneurial journey
- b. Common phases: ideation → validation → growth → maturity
- c. What defines a “professional business”?
- d. Shifting from founder-led operations to process-driven leadership
- e. Developing governance, structure, and accountability
- f. Emotional transition from “entrepreneur” to “enterprise leader”
- g. Legal structuring and compliance
- h. Financial reporting, audits, and tax discipline
- i. HR systems, organizational hierarchy, and SOPs
- j. Customer service systems and quality control
- k. Moving beyond product-market fit to product-market dominance
- l. Market expansion, partnerships, and channel development
- m. Strategic acquisitions or franchising as a growth model

Suggested Reading/Recommended Resources:

1. Billion Dollar Patents: Strategies for Finding Opportunities, Generating Value, and Protecting Your Inventions Paperback – December 16, 2019. by [Joanna T Brougher](#) (Author)
2. National Academies of Sciences, Engineering, and Medicine; Division on Earth and Life Studies; Board on Environmental Studies and Toxicology; Committee on Incorporating 21st Century Science into Risk-Based Evaluations. Using 21st Century Science to Improve Risk-Related Evaluations.

Washington (DC): National Academies Press (US); 2017 Jan 5. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK424983/> doi: 10.17226/24635

3. Markossian S, Grossman A, Baskir H, et al., editors. Assay Guidance Manual [Internet]. Bethesda (MD): Eli Lilly & Company and the National Center for Advancing Translational Sciences; 2004-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK53196/>

4. Manual on Entrepreneurship development.pdf

5. https://ddceutkal.ac.in/Syllabus/MCOM/Entrepreneurship_Development.pdf

6. Teague, B, Tunstall, R orcid.org/0000-0001-7645-0276, Champenois, C et al. (1 more author) (2021) An introduction to entrepreneurship as practice (EAP). International Journal of Entrepreneurial Behavior and Research, 27 (3). pp. 569-578. ISSN 1355-2554

<https://doi.org/10.1108/IJEBr-04-2021-87>

7. Gurunani S G, Mangrulkar S V, Jawal D T, Chaple D R, Bioentrepreneurship: A venture for commercializing biotechnological knowledge. *IP Int J Compr Adv Pharmacol* 2021;6(2):48-52

8. <https://bowenstaff.bowen.edu.ng/lectureslides/1730042049.pdf>

9. [Scilife | A Guide to Bringing a Medical Device to Market.pdf](#)

Conclusion:

This course will pave thoughts of thinking beyond textbook knowledge and encourage young entrepreneurs to create opportunities for themselves and also become job creators, driving economic growth and community development. Further Social entrepreneurship, in particular, will empower the youth to address pressing societal challenges like climate change, healthcare access, and education equity, making a lasting difference. We aim to foster this mindset in those willing to embrace this journey early, the rewards will be beyond personal success, contributing to societal progress and shaping a better future.

Those students who successfully clear this course can be selected for the advanced course in the same field.

Brief Biodata of Lecturers:

1. Dr Jyoti Kode, Navi Mumbai
Webpage: <https://www.actrec.gov.in/dr-jyoti-anand-kode>
ORCID id: <http://orcid.org/0000-0001-6907-2449>
<https://scholar.google.com/citations?user=M5fNh5cAAAAJ&hl=en>
2. Dr Ravi Rayanade, Mumbai
Chairman, Visionbiosciences, Mumbai
<https://visionbiosciences.in/>
3. Dr Sudha Rao, Bangalore
 - a. Executive Director, Genotypic Technology Pvt. Ltd.
 - b. www.genotypic.co.in

4. Dr Raja Mugasimangalam, Bangalore
 - a. Founder and CEO Genotypic Technology and QTLomics | Genomics, Biotechnology, Bangalore, Karnataka
 - b. <https://www.linkedin.com/in/mcraja/?originalSubdomain=in>
5. Dr Kaikhushru Parakh, Pune
 - a. Consultant, Medical devices.
6. Dr Vivek Varma, Mumbai
 - a. Healthcare Business Strategy ! Life Science Consulting ! Operations ! Regulatory Affairs! Molecular & POC Diagnostics, Mumbai, Maharashtra, India
 - b. <https://www.linkedin.com/in/vivek-varma-ph-d-62a39b7/?originalSubdomain=in>
7. Dr Muthu Dhandapani, Bangalore
 - a. Vice-President, Regulatory Compliance, Tricog Health, Bangalore
 - b. <https://www.linkedin.com/in/dr-muthu-dhandapani-phd-8401a513/>
8. Dr Meera Sharma, Gujarat
 - a) Registered Patent Attorney, Scientific Advisor with Indian Patent Office, Co-Director, Engi Corporate Services
 - b) <https://www.linkedin.com/in/meera-sharma-06233a15b/>
9. Dr Swarada Peerannawar, Pune
 - a. Founder, DHARA CONSULTANCY SERVICES [Ph. D. Chemistry, Postdoctoral UMASS BOSTON, Patent Agent], Pune
 - b. https://www.linkedin.com/in/dr-swarada-peerannawar-809aa820/?original_referer=https%3A%2F%2Fwww%2Egoogle%2Ecom%2F&originalSubdomain=in
10. Dr Rushikesh Patil, Vapi, Gujarat
 - a. MicroCRISPR
 - b. <https://www.linkedin.com/in/rushikesh-patil-0b3929133/>
11. Dr Anita Joshi, Pune
 - a) Founder, Dr Anita's BioConsultancy | IVD and medical devices | Biopharma | | Adding value through Training | Regulatory documentation | Gap analysis & Internal Audits |
 - b) <https://www.linkedin.com/in/dr-anita-joshi-4641056/?originalSubdomain=in>