ONGOING COUREWORK:

7th Semester

1. **Tissue Engineering (BME 4071) – 3 credit**
   Course outcome 1- Understand fundamental aspects of cellular behavior and cell signaling in tissue engineering.
   Course outcome 2: Basic understanding of engineering specific cells and tissues.
   Course outcome 3: Understand the design aspects of polymeric scaffolds .
   Course outcome 4: Understand the key issues to deal with cell/tissue culture and correlation with matrix and tissue behaviour.
   References:
   - Joseph W. Freeman, Debabrata Banerjee, Building Tissues: An Engineer's Guide to Regenerative Medicine, Edition : 1st , 2018 , ISBN 9781498742801 , CRC Press
   - Bikramjit Basu, Biomaterials Science and tissue Engineering –Principles and Methods, Edition -1, Cambridge University Press, 2017, ISBN: 978-1-108-41515-6
   - CV Blitterswijk, Tissue Engineering, Academic Press, 2008, ISBN: 9780123708694
   - Satish Totey, Kaushik D. Deb, Stem Cell Technologies: Basics and Applications, McGraw-Hill Education, 2010, ISBN: 9780071635721
   - Ross & Wilson, Anatomy and Physiology in Health and Illness, 13th Edition, Authors: Anne Waugh Allison Grant, Imprint: Elsevier, 2018, ISBN: 9780702072833
   - Robert Lanza, Robert Langer, Joseph Vacanti, Anthony Atala, Principles of Tissue Engineering, 5th Edition, Imprint: Academic Press, 2020, ISBN: 9780128184226

2. **Pattern Recognition (BME 4068)- 3 credit**
   Course outcome 1- understand the principles and concepts of the basic pattern recognition system.
   Course outcome 2- Understand the design of parametric classifiers.
   Course outcome 3- Develop skills for finding clusters.
   Course outcome 4- An appreciation of artificial neural networks as classifiers
   Course outcome 5-Ability to identify the necessity of appropriate classifiers in different applications.
   References:
   - S. N. Sivanandam, and S. N. Deepa, "Principles of Soft Computing", Wiley India Edition, New Delhi, 2010.
   - S. N. Sivanandam, S. Sumathi and S. N. Deepa, "Introduction to Neural Networks using MATLAB 6.0", TATA McGRAW HILL, New Delhi, 2006.
   - B Yegnanarayana, Artificial Neural Networks, Prentice Hall, 2001.

- D L Hudson and ME Cohen, Neural Networks and Artificial Intelligence for Biomedical Engineering, Prentice Hall, 2001.
- Earl Gose, Richard, Johnson Baugh and Steve Jost, "Pattern recognition and Image analysis", Prentice Hall, New Delhi, 2002

3. **Healthcare management (BME 4072) -3 credit**

   Evolution of healthcare, Principles and functions of management, leadership theories, motivation theories, Hospital statistics, quality indicators, Radiology services, emergency services, tools of quality, equipment management, pharmacy services, ICU services, in-patient and out-patient department services, disaster management in hospitals.

   References:

   - Hospital Administration - Joshi DC
   - Hospital Planning & Administration – B.M. Sakharkar
   - Laws in Hospital Administration – SK Joshi
   - Quality Management – SK Joshi

4. **Financial management (HUM 4051) - 3 credit**

   Course outcome 1- Comprehend the basic functions and responsibilities of a financial department in a business.
   Course outcome 2- Apply the accounting principles and prepare financial statements.
   Course outcome 3- Analyze the nature of various financing choices.
   Course outcome 4- Evaluate and make decisions regarding investments and funding alternatives.
   Course outcome 5- Explore and establish the basic knowledge of working capital management policies.

   References:

   - Prasanna Chandra, Financial Management-Theory and Practice, 9th Edition, Tata McGraw Hill Education, 2016.
   - IM Pandey. Financial Management. Vikas Publishing Hase, 2015.
   - Eugene F Brigham and Michael C E. Financial Management: Theory and Practice, 16th Edition, Cengage Learning, 2019.
   - N Ramachandran and Ram Kumar Kakani. Financial Accounting for Management, 3rd Edition, Tata McGraw Hill Education, 2011.
   - R. Narayanaswamy. Financial Accounting: A Managerial Perspective, 6th Edition, PHI Learning, 2017.

5. **Operational management (HUM 4054)- 3 credit**

   Course outcome 1- Understand and analyze the importance of operations for a firm.
   Course outcome 2- Demonstrate decision making ability in core areas of operations such as forecasting, capacity planning, and managing bottlenecks in operations.
   Course outcome 3- Develop operations plan to execute business operations on a short run.

Course outcome 4- Understand the basic concepts of Supply Chain Management and Quality Management.

References:

- Krajewski L. J., Ritzman L. P., Malhotra M., and Srivastava S. K. (2016), "Operations Management", I Ith edition, Pearson Education (Singapore) Pvt. Ltd., Delhi.
- Heizer J. and Render B. (2016), "Operations Management", 1 I th edition. Pearson Education India.
- Khanna R. B.(2015), "Production and Operations Management". 2nd edition, PHI Learning Private Limited.

6. **Health economics (Optional elective) (IIE 4308) – 3 credit**

Course objective

Health economics is a branch of economics that analyses the allocation of resources, costs, and benefits within the healthcare sector. It examines how limited resources can be efficiently distributed to maximize the overall health and well-being of a population. Health economics considers factors such as healthcare delivery systems, medical treatments, insurance mechanisms, and healthcare policies. It involves assessing the trade-offs between various healthcare interventions, evaluating the cost-effectiveness of medical treatments, and studying the impact of healthcare policies on both individual and societal levels. By applying economic principles to the healthcare domain, health economics seeks to inform decision-making, enhance resource utilization, and improve the overall health outcomes of individuals and communities while considering the financial constraints of healthcare systems.

Learning outcome

- Understanding of basic economic principles and in relation to health
- Awareness of real-world challenges in healthcare resource distribution and equity considerations.
- Interpret and appropriately apply the key concepts of economics within the context of health system.
- Multilevel decision-making insights, applying knowledge to real-world scenarios for informed contributions to healthcare discussions and decisions.

8th semester:

Industrial Training (1 credit) – Completed at Innovation Imaging Technologies Private limited, Bangalore.

Project Work/Practice School (12 credits) – Accepter Offer at Novo Nordisk, Bangalore