

## INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

**NAME OF DEPARTMENT:** Department of Design

1. **Subject Code:** IDN-503 **Course Title:** Design Thinking
2. **Contact Hours:** **L:** 1 **T:** 0 **P:** 4
3. **Examination Duration (Hrs.):** **Theory:** 2 **Practical:** 0
4. **Relative Weightage:** **CWS:** 10-25 **PRS:** 25 **MTE:** 15-25 **'ETE:** 0 **PRE:** 30-40
5. **Credits:** 3 **6. Semester:** Autumn **7. Subject Area:** PCC
8. **Pre-requisite:** Nil
9. **Objective:** To develop courage amongst young designers to think and design creatively in order to develop innovative products based on user's need.

### 10. Details of the Course

| S.No.        | Contents  | Contact hours |
|--------------|---|---------------|
| 1.           | Design Thinking: Introduction, key concepts, terminologies.               | 2             |
| 2.           | Process of Design Thinking: Steps involved and applications.              | 2             |
| 3.           | Empathy: Role of empathy, process of empathizing people, user interviews. | 2             |
| 4.           | Define: Methods for identifying challenges and designer's point of view.  | 2             |
| 5.           | Ideate: Elements and thinking modes, ideation techniques.                 | 2             |
| 6.           | Prototype: Types of prototypes, methods and techniques for prototyping.   | 2             |
| 7.           | Testing: Feedback from users, getting honest feedback, improving design.  | 2             |
| <b>Total</b> |   | <b>14</b>     |

### Studio/Project Work:

The practical work will include design studio workshops leading to ideation and brainstorming. The innovative design thinking strategies will be employed to create a habit of inquisitiveness among the students. The process of conducting user interviews leading to identification of needs and recording of the information in standard templates will be undertaken. The user defined needs will be analyzed and product concepts leading to the first form of prototypes will be the major deliverable of the course.

### 11. Suggested Books:

| S.No. | Name of Authors/Book/Publisher   | Year of Publication / Reprint |
|-------|--|-------------------------------|
| 1.    | Tim Brown, 'Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation' Harper Business                                | 2009                          |
| 2.    | Roger L. Martin, 'The Design of Business: Why Design Thinking is the Next Competitive Advantage' Harvard Business Review Press                     | 2009                          |
| 3.    | Tom Kelley, Jonathan Littman, Tom Peters 'The Art of Innovation: Lessons in Creativity from IDEO, America's Leading Design Firm' Broadway Business | 2001                          |

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|----|--|------|
| 4. | John Christopher Jones, "Design Methods-Seeds of Human Future"<br>John Wiley and Sons. | 2008 |
| 5. | Thomas T. Woodson, "Introduction to Engineering Design" McGraw-Hill.                   | 2001 |

## INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

**NAME OF DEPARTMENT/CENTRE:** Department of Design

1. **Subject Code:** IMN-503 **Course Title:** Effective Communication
2. **Contact Hours:**            **L:** 1                    **T:** 1                    **P:** 0
3. **Examination Duration (Hrs.):**    **Theory:** 0                    **Practical:** 2
4. **Relative Weightage:** **CWS:** 20-35    **PRS:** 20-30    **MTE:** 0    **ETE:** 0    **PRE:** 40-50
5. **Credits:** 2                                    **6. Semester:** Autumn                    **7. Subject Area:** PCC
8. **Pre-requisite:** Nil
9. **Objective:** The course emphasis on effective use of communication for innovation.

### 10. Details of the Course

| S.No.        | Contents  | Contact hours |
|--------------|---|---------------|
| 1.           | <b>Understanding Communication Styles:</b> Introduction to Communication, Types of communications, Passive Communication, Aggressive Communication, Passive-Aggressive Communication, Assertive Communication   | 2             |
| 2.           | <b>Communicating in Writing:</b> Using Written Communication, Pros and Cons of Written Communication, Tips for Avoiding Misunderstandings in Written Communication, The Importance of Good Conversational Skills, Active Listening, Be an Engaging Speaker                  | 2             |
| 3.           | <b>Communications Technology:</b> Modern Technologies, Benefits of Communications Technology, Drawbacks of Communications Technology  | 2             |
| 4.           | <b>Cultural Aspects of Communication:</b> Introduction to culture, Working in a Global Community  | 2             |
| 5.           | <b>Disagreements and Conflicts:</b> Nature of conflict, Avoiding Conflict, Fostering Healthy Conflict, Conflict Resolution, Negotiation, Compromise, Constructive Criticism: The Critic-Recipient Relationship, Personal Criticism, Offering Criticism, Receiving Criticism | 3             |
| 6.           | <b>Design related Communication:</b> Proof of Concept Writing, Drafting Patents and related case studies for best practice  | 3             |
| <b>Total</b> |   | <b>14</b>     |

### List of suggested Practical:

1. Active listening skill based exercises
2. Exercises on describing design/ innovation
3. Exercises on creating effective atmosphere for conflict resolution
4. Creative Problem solving technique exercises such as Six Thinking hats
5. Brainstorming session based exercises
6. Exercises on negotiation

## 11. Suggested Books:

| S.No. | Name of Authors/Book/Publisher   | Year of Publication / Reprint |
|-------|--|-------------------------------|
| 1.    | <b>Effective Business Communication</b> by Herta Murphy, Herbert Hildebrandt, Jane Thomas    | 2017                          |
| 2.    | <b>Effective Communication</b> by John Adair   | 2009                          |
| 3.    | Corporate Communication, <b>Paul A. Argenti</b> , Tata McGraw Hill, 6 <sup>th</sup> Edition  | 2013                          |
| 4.    | Business Communication: Connecting at Work, Hory Shankar Mukherjee, Oxford University Press, | 2013                          |

## INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

**NAME OF DEPARTMENT/CENTRE:** Department of Design

1. **Subject Code:** IMN-505 **Course Title:** Business Valuation
2. **Contact Hours:** **L:** 2 **T:** 1 **P:** 0
3. **Examination Duration (Hrs.):** **Theory:** 2 **Practical:** 0
4. **Relative Weightage:** **CWS:** 20-35 **PRS:** 0 **MTE:** 20-30 **ETE:** 40-50 **PRE:** 0
5. **Credits:** 3 **6. Semester:** Autumn **7. Subject Area:** PCC
8. **Pre-requisite:** Nil
9. **Objective:** The course is designed to provide in-depth knowledge of Business Valuation.

### 10. Details of the Course

| S.No.        | Contents  | Contact hours |
|--------------|---|---------------|
| 1.           | <b>Introduction to Business Valuation Process:</b> Concept of Value, Principles & Techniques of Valuation, Discounted Cash Flow Valuation, Relative Valuation, Contingent claim Valuation, Asset Valuation, Related concepts in Business valuation              | 6             |
| 2.           | <b>Discounted Cash flow Valuation.:</b> Estimating Discount Rates, Measuring Cash Flows, Forecasting Cash Flows, Equity Discounted Cash Flow Models, Firm Valuation Models.   | 5             |
| 3.           | <b>Relative Valuation.:</b> Relative Valuation: First Principles, Equity Multiples, Value Multiples.  | 4             |
| 4.           | <b>Loose Ends in Valuation:</b> Cash, Cross Holdings and Other Assets, Employee Equity Options and Compensation, The Value of Intangibles, The Value of Control, The Value of Liquidity, The Value of Synergy, The Value of Transparency, The Cost of Distress. | 7             |
| 5.           | <b>Contemporary Issues:</b> Valuation of Synergy in mergers and acquisitions, valuation of companies using multiplier methods, some miscellaneous topics in valuation   | 6             |
| <b>Total</b> |   | <b>28</b>     |

### 11. Suggested Books:

| S.No. | Name of Authors/Book/Publisher  | Year of Publication / Reprint |
|-------|---|-------------------------------|
| 1.    | Damodaran on Valuation: Security Analysis for Investment and Corporate Finance: Aswath Damodaran by Wiley.              | 2006                          |
| 2.    | Business Analysis and Valuation: Using Financial Statements, Text and Cases: Krishna G. Palepu/Paul M. Healy by Cengage | 2007                          |
| 3.    | Investment Valuation: Tools and Techniques for Determining the Value of Any Asset: Aswath Damodaran by Wiley.           | 2012                          |

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|----|---|------|
| 4. | Financial Engineering: John F Marshall and Vipul K. Bansal by PHI<br>New Delhi. | 2009 |
| 5. | Investments : Bodie, Kane, Marcus and Mohanty by Tata McGraw<br>Hill.           | 2015 |
| 6. | Business Valuation Text & Cases, Mohanty P., Taxman                             | 2015 |



|    |   |      |
|----|---|------|
|    | Asia: Longitudinal Narratives): Mathew J. Manimala, Kishinchand Poornima Wasdani, Abhishek Vijaygopal by Springer   |      |
| 3. | <b>Innovation and Entrepreneurship:</b> Peter F. Drucker by Harper Business   | 2006 |
| 4. | How to Change the World Social Entrepreneurs and the Power of New Ideas: David Bornstein by Oxford University Press | 2007 |

## INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

**NAME OF DEPARTMENT/CENTRE:** Department of Design

1. **Subject Code:** IMN-509                      **Course Title:** Legal Aspects of Business
2. **Contact Hours:**                      **L:** 2                      **T:** 0                      **P:** 0
3. **Examination Duration (Hrs.):**                      **Theory:** 2                      **Practical:** 0
4. **Relative Weightage:**    **CWS:** 20-35    **PRS:** 0    **MTE:** 20-30    **ETE:** 40-50    **PRE:** 0
5. **Credits:** 2                      **6. Semester:** Autumn                      **7. Subject Area:** PCC
8. **Pre-requisite:** Nil
9. **Objective:** To provide knowledge of various laws related to business and also various standards needed for business.

### 10. Details of the Course

| S.No.        | Contents  | Contact hours |
|--------------|---|---------------|
| 1.           | Introduction to Business Law: Introduction, Meaning and Nature of Law, Sources of Indian Law, Legal Environment of Business, Mercantile Law, Some Basic Legal Concepts, Essentials of Law.  | 4             |
| 2.           | Law of contract –Introduction, Objectives, Definition of a Valid Contract, Offer and Acceptance, Capacity to Contract, Consent Consideration, Performance of Contracts, Discharge of Contracts, Breach of Contract and Void Agreements, Quasi Contracts, Freedom to Contract.   | 4             |
| 3.           | Contract of Agency – Introduction, Agent and Agency, Kinds of Agencies, Classification of Agents, Duties and Rights of Agents, Principal’s Duties to the Agent and his Liability to Third Parties, Personal Liability of Agent, Termination of Agency, Power of Attorney  | 4             |
| 4.           | Law of Partnership: Introduction, Meaning and Nature of Partnerships, Registration of Firms, Partnership Deed, Relations of Partners to One Another, Relations of Partners to Third Parties, Changes in a Firm, Dissolution   | 4             |
| 5.           | The Company’s Act: Introduction, Formation of a Company, Memorandum of Association, Articles of Association, Prospectus, Shares, Directors, General Meetings and Proceedings, Auditor, Winding up.  | 4             |
| 6.           | Regulation to Information- Introduction, Right to Information Act, 2005, Information Technology Act, 2000, Electronic Governance, Secure Electronic Records and Digital Signatures, Digital Signature Certificates, Cyber Regulations Appellate Tribunal, Offences, Limitations of the Information Technology Act, 2000 | 3             |
| 7.           | Different standards - Environment Standards, ISO9000, ISO 14000, ISO22000, Good Manufacturing Practices, Good Agriculture Practice  | 5             |
| <b>Total</b> |   | <b>28</b>     |

## 11. Suggested Books:

| <b>S.No.</b> | <b>Name of Authors/Book/Publisher</b>   | <b>Year of Publication / Reprint</b> |
|--------------|---|--------------------------------------|
| 1.           | Daniel A., Legal Aspects of Business, Oxford University Press                   | 2015                                 |
| 2.           | Pathak A., Legal aspects of Business, McGraw Hill                               | 2018                                 |
| 3.           | Gupta P., Legal Aspects of Business Concepts and Applications, Vikas Publishing | 2019                                 |
| 4.           | Kumar R., Legal Aspects of Business, Cengage                                    | 2016                                 |

## INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

**NAME OF DEPARTMENT/CENTRE:** Department of Design

1. **Subject Code:** IMN-511                      **Course Title:** Business Decision Making
2. **Contact Hours:**                      **L:** 3                                      **T:** 0                                      **P:** 0
3. **Examination Duration (Hrs.):**                      **Theory:** 3                                      **Practical:** 0
4. **Relative Weightage:**    **CWS:** 20-35                      **PRS:** 0                      **MTE:** 20-30                      **ETE:** 40-50                      **PRE:** 0
5. **Credits:** 3                                      **6. Semester:** Autumn                                      **7. Subject Area:** PCC
8. **Pre-requisite:** Nil
9. **Objective:** The course is designed to provide in-depth knowledge of techniques used in decision making.

### 10. Details of the Course

| S.No. | Contents  | Contact hours |
|-------|---|---------------|
| 1.    | <p><b>Decision Making-</b> Introduction, Problem Solving and Decision Making, Decision processes: Descriptive and Prescriptive orientation, Decision Making Tools and Models, Quantitative and Qualitative Methods in Practice</p> <p><b>Probability-</b> Introduction, Experiments and the Sample Space, Assigning Probabilities to Experimental Outcomes, Events and Their Probabilities, Some Basic Relationships of Probability, Bayes' Theorem, Probability Distributions, Random Variables, Discrete Probability Distributions, Uniform Probability Distribution, Normal Probability Distribution</p> | 6             |
| 2.    | <p><b>Decision Analysis-</b> Problem Formulation, Decision Making with/without Probabilities, Decision Analysis with Sample Information, Computing Branch Probabilities</p> <p><b>Utility-</b>The Meaning, Utility and Decision Making, Utility: Other Considerations</p>   | 6             |
| 3.    | <p><b>Forecasting Methods and Techniques-</b> Quantitative Approaches, Components of a Time Series, Smoothing Methods, Trend Projection, Trend and Seasonal Components) Qualitative Approaches (Group Decision Techniques), Delphi Approach and Survey. Focus Group. Brain Storming/Scenario Writing, Nominal Group Think and Kiva Approach</p>   | 6             |
| 4.    | <p><b>Linear Programming-</b> Introduction, Problem Formulation, A Simple Maximization Problem, Graphical Solution Procedure, Extreme Points and the Optimal Solution, Computer Solutions, A Simple Minimization Problem</p> <p><b>Sensitivity Analysis-</b> Interpretation of Solution, Introduction to Sensitivity Analysis Objective Function Coefficients, Right-Hand Sides, Graphical Sensitivity Analysis, Computer Solution, Simultaneous Changes</p>  | 8             |
| 5.    | <p><b>Applications of LP-</b> Marketing and Financial Applications, Operations Management Applications, Distribution and Network Models, Transportation Problem, Assignment Problem, Production and Inventory Application</p>   | 5             |
| 6.    | <p><b>Integer Programming-</b> Types &amp; Models, Graphical and Computer Solutions for an</p>  | 5             |

|              |  |           |
|--------------|--|-----------|
|              | All-Integer Linear Program, Applications.  |           |
| 7.           | <b>Simulation-</b> Simulation Modeling & Applications, Advantages and Disadvantages of Using Simulation                                    | 3         |
| 8.           | Project Scheduling: PERT/CPM Project Scheduling with Known Activity Times (project management techniques) Considering Time-Cost Trade-Offs | 3         |
| <b>Total</b> |  | <b>42</b> |

### 11. Suggested Books:

| S.No. | Name of Authors/Book/Publisher   | Year of Publication / Reprint |
|-------|--|-------------------------------|
| 1.    | <b>Quantitative Methods for Business</b> by Anderson, Sweeney, Williams, Camm, Martin. South-Western Cengage Learning.             | 2010                          |
| 2.    | <b>Introduction to Operations Research</b> by F S Hillier, G J Lieberman B Nag and P Base , 10 <sup>th</sup> Edition, McGraw Hill. | 2017                          |
| 3.    | <b>Operations Research: An Introduction</b> by H A Taha 9 <sup>th</sup> Edition Pearson  | 2014                          |
| 4.    | <b>Statistics for Management</b> by RI Levin, David Rubin, M.H.Siddiqui and Sanjay Rastogi 8 <sup>th</sup> Edition, Pearson        | 2017                          |

## INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

**NAME OF DEPARTMENT/CENTRE:** Department of Design

1. **Subject Code:** IMN-513 **Course Title:** Contemporary Management Practices
2. **Contact Hours:** **L:** 2 **T:** 0 **P:** 0
3. **Examination Duration (Hrs.):** **Theory:** 2 **Practical:** 0
4. **Relative Weightage:** **CWS:** 20-35 **PRS:** 0 **MTE:** 20-30 **ETE:** 40-50 **PRE:** 0
5. **Credits:** 2 **6. Semester:** Autumn **7. Subject Area:** PCC
8. **Pre-requisite:** Nil
9. **Objective:** The course is designed to familiarize the students with basic management concepts and behavioral processes in the organization.

### 10. Details of the Course

| S.No.        | Contents   | Contact hours |
|--------------|--|---------------|
| 1.           | <b>Concepts of Management:</b> Nature, Meaning, and Significance of Management, Managerial functions, Principles of Management, Managers V/s Entrepreneurs- Managers V/s Leaders- Guidelines for Managerial Excellence and success. Evolution of Management Thoughts-Traditional, Behavioral, Systems, Contingency and Quality viewpoints. | 5             |
| 2.           | <b>Planning:</b> Nature & Elements of Planning, Planning types and Models, Planning in learning organizations; Strategic Planning-an overview; Management by Objectives (MBO), SWOT Analysis   | 4             |
| 3.           | <b>Organizing and Staffing:</b> Nature of Organizing, Basic issues in organizing- Work Specialization, chain of command Delegation, Staffing Decisions- Authority and Responsibility Relationships, Decision Making Process, Models of Decision Making.  | 4             |
| 4.           | <b>Directing and Controlling:</b> Nature of Evaluation Design and Problems- Appraising Techniques- Developing Compensation Plans, Direction, Co-ordination, Quantitative and Qualitative measures of Control, Feed-back Management. System and Process of Controlling, Control techniques and information technology.                      | 4             |
| 5.           | <b>Fortune at Bottom of Pyramid :</b> Issues for entrepreneurial opportunities of BoP  | 3             |
| 6.           | <b>Ethical Issues in Management:</b> Corporate Social Responsibility of Business, Corporate Governance   | 4             |
| 7.           | <b>New Trends in Management:</b> case studies on latest management practices   | 4             |
| <b>Total</b> |  | <b>28</b>     |

## 11. Suggested Books:

| <b>S.No.</b> | <b>Name of Authors/Book/Publisher</b>   | <b>Year of Publication / Reprint</b> |
|--------------|---|--------------------------------------|
| 1.           | <b>Essentials of Management</b> by Harold Koontz, Cyril O'Donnell. McGraw Hill.   | 1974                                 |
| 2.           | <b>Essentials of Management: An International and Leadership Perspective</b> by Harold Koontz, Heinz Weihrich, McGraw Hill                        | 2008                                 |
| 3.           | <b>The Process of Management: Strategy, Action, Results</b> by William H. Newman, E. Kirby Warren & Andrew R. McGill. Prentice Hall International | 1987                                 |
| 4.           | Prahalad, C.K., "Fortune at the Bottom of the Pyramid: Eradicating Poverty Through Profits", Pearson  | 2013                                 |
| 5.           | Udai Parek. & Sushama Khanna, Understanding Organizational Behavior, Oxford University Press 4 <sup>th</sup> Edition                              | 2018                                 |





## 11. Suggested Books:

| <b>S.No.</b> | <b>Name of Authors/Book/Publisher</b>  | <b>Year of Publication / Reprint</b> |
|--------------|--|--------------------------------------|
| 1.           | Grant, Robert M., "Contemporary Strategy Analysis: Concepts, Techniques, Applications", 7th Edition. John Wiley & Sons   | 2010                                 |
| 2.           | Hitt, Ireland & Hoskisson, "Strategic Management", Cengage Learning  | 2016                                 |
| 3.           | Thompson, A.J., Peteraf, M., Gamble, J. and Strickland, A., "Crafting & Executing Strategy: The Quest for Competitive Advantage: Concepts and Cases", 21 <sup>st</sup> Ed., McGraw-Hill Higher Education | 2017                                 |
| 4.           | Kim, W.C. and Mauborgne, R.A., "The Blue Ocean Strategy: How to Create Uncontested Market Space and Make the Competition Irrelevant", Harvard Business Press   | 2015                                 |
| 5.           | Thomson & Strickland "Crafting and Executing Strategy: The quest for Competitive Advantage", Tata McGraw – Hill  | 2017                                 |

## INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

**NAME OF DEPARTMENT/CENTRE:** Department of Design

1. **Subject Code:** IMN-506                      **Course Title:** Intellectual Property Management
2. **Contact Hours:**                      **L:** 2                      **T:** 1                      **P:** 0
3. **Examination Duration (Hrs.):**                      **Theory:** 2                      **Practical:** 0
4. **Relative Weightage:**    **CWS:** 20-35                      **PRS:** 0                      **MTE:** 20-30                      **ETE:** 40-50                      **PRE:** 0
5. **Credits:** 3                      6. **Semester:** Spring                      7. **Subject Area:** PCC
8. **Pre-requisite:** Nil
9. **Objective:** To impart knowledge about managing various IPs such as patents, copyrights and designs etc.

### 10. Details of the Course

| S.No.        | Contents  | Contact hours |
|--------------|---|---------------|
| 1.           | Intellectual Property Management. Market Capitalization, Intellectual Capital (IC), Components of Intellectual Capital, Tangible and Intangible Assets of Firms               | 4             |
| 2.           | Corporate Strategy, and Profits, Relationship between Intellectual Capital and Intellectual Property, Knowledge Economy and the need for Intellectual Property Management     | 6             |
| 3.           | Various Types of Intellectual Property trademarks, Copyrights, Patents, Trade Secrets, and Industrial Design  | 6             |
| 4.           | International IP Treaties/Agreements on IP Rights, Types of Patents, Patenting Advantage, Offensive and Defensive IP Strategies, Global Innovation Index's and IP Management. | 6             |
| 5.           | The Dynamics of Value Creation and Value Capture, Patent Mapping and relevant case studies  | 6             |
| <b>Total</b> |   | <b>28</b>     |

### 11. Suggested Books:

| S.No. | Name of Authors/Book/Publisher   | Year of Publication / Reprint |
|-------|--|-------------------------------|
| 1.    | Marchant GE. Genomics, Ethics, and Intellectual Property. In Intellectual Property Management in Health and Agricultural Innovation: A Handbook of Best Practices (eds. A Krattiger, RT Mahoney, L Nelsen, et al.). MIHR: Oxford, U.K., and PIPRA: Davis, U.S.A. | 2007                          |
| 2.    | Phillips, PWB. Governing Transformative Technological Innovation: Who's in Charge? Edward Elgar: Oxford  | 2007                          |
| 3.    | Spielman DJ., Systems of Innovation: Models, Methods and Future Directions. Innovation Strategy Today 2(1):55-66   | 2006                          |
| 4.    | WIPO, The Economics of Intellectual Property   | 2009                          |
| 5.    | OECD, Creating Value from Intellectual Assets, Policy Report   | 2007                          |



## INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

**NAME OF DEPARTMENT/CENTRE:** Department of Design

1. **Subject Code:** IMN-510                      **Course Title:** Product Innovation Management
2. **Contact Hours:**                      **L:** 2                      **T:** 0                      **P:** 0
3. **Examination Duration (Hrs.):**      **Theory:** 2                      **Practical:** 0
4. **Relative Weightage:**    **CWS:** 20-35      **PRS:** 0      **MTE:** 20-30      **ETE:** 40-50      **PRE:** 0
5. **Credits:** 2                      **6. Semester:** Spring                      **7. Subject Area:** PCC
8. **Pre-requisite:** Nil
9. **Objective:** To impart knowledge in innovation, strategy, design, and the management of new products.
10. **Details of the Course**

| S.No.        | Contents  | Contact hours |
|--------------|---|---------------|
| 1.           | Overview of Product, Strategic Elements of Product Development, The Product Innovation Charter (PIC), New Product Portfolio, The New Products Process and its Phases, product development cycle.                          | 3             |
| 2.           | Opportunity Identification and Selection, Strategic Planning for New Products, Product Platform Planning, Concept Generation, Creativity and the Product Concept.   | 2             |
| 3.           | Analytical Attribute Approaches, Perceptual Mapping, Analysing Product Attributes for Concept Generation and Evaluation, Gap Analysis, Trade-Off Analysis and Qualitative Techniques                                      | 4             |
| 4.           | Concept/Project Evaluation, Product Line Considerations in Concept Evaluation, Planning the Evaluation System, The A-T-A-R Model, Product Innovation Charter, Concept Testing and Development                             | 4             |
| 5.           | Design, The Role of Design in the New Products Process, Product Architecture Prototype, The valley of Death   | 4             |
| 6.           | Development, Development Team Management, Structuring the Team, building a Team, Managing the Team, Virtual Teams, Managing Globally Dispersed Teams, Product Use Testing, Pre-Use Sense Reactions, Early Use Experiences | 4             |
| 7.           | Strategic Launch Planning, Strategic Platform Decisions, Type of Demand Sought, Product Positioning Branding and Brand Management, packaging, Implementation of the Strategic Plan  | 3             |
| 8.           | Launch management system, steps, knowledge creation, product failure, failure management, product issues, Business Attitudes toward Product Issues, product liability, planning for product recall                        | 4             |
| <b>Total</b> |   | <b>28</b>     |

## 11. Suggested Books:

| <b>S.No.</b> | <b>Name of Authors/Book/Publisher</b>  | <b>Year of Publication / Reprint</b> |
|--------------|--|--------------------------------------|
| 1.           | Crawford, M. and Di Benedetto, A.,” New products management”, McGraw Hill International  | 2014                                 |
| 2.           | Trott, Paul. “Innovation Management & New Product Development”, Prentice Hall, Pearson   | 2011                                 |
| 3.           | John Bessant, Joe Tidd, Keith Pavitt “Managing Innovation: Integrating Technological, Market, and Organizational Change”, John Willey and Sons Ltd | 2013                                 |
| 4.           | Verganti, R, Design driven innovation: Changing the rule of competition by radically innovating what things mean, Harvard Business Press, Boston   | 2009                                 |
| 5.           | Clayton M. Christensen “The Innovator's Dilemma When New Technologies Cause Great Firms to Fail”, Harvard Business Review Press                    | 2015                                 |

## INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

**NAME OF DEPARTMENT/CENTRE:** Department of Design

1. **Subject Code:** IMN-512                      **Course Title:** Innovative Services and Business Models
2. **Contact Hours:**            **L:** 3    **T:** 0    **P:** 0
3. **Examination Duration (Hrs.):**            **Theory:** 3    **Practical:** 0
4. **Relative Weightage:**    **CWS:** 20-35            **PRS:** 0            **MTE:** 20-30            **ETE:** 40-50            **PRE:** 0
5. **Credits:** 3    6. **Semester:** Spring    7. **Subject Area:** PCC
8. **Pre-requisite:** Nil
9. **Objective:** To enable students to identify, implement and evaluate innovative service offerings and business models.

### 10. Details of the Course

| S.No.        | Contents   | Contact hours |
|--------------|--|---------------|
| 1.           | Service Economy and Service Organizations, Role of services in manufacturing firms, recent trends in manufacturing   | 4             |
| 2.           | Developing a service strategy, service positioning and implications for service delivery design, degree of customer contact, divergence, customization; Service blue printing  | 3             |
| 3.           | Product, Technology, Process and People-centric Services, Technical View of Services: Techniques for Service Analysis, Work System Method, Service Value Networks  | 5             |
| 4.           | Business Models, Components of the business model, Business Model Canvas, Various types of Business Models, Generating New Business Model Ideas, Ideation Process, Visual Thinking, Different Types of Visualization.  | 8             |
| 5.           | The value proposition, Elements of intangibles, Value creation through intellectual resources  | 8             |
| 6.           | Business Model Design Process Design Attitude five phases (Mobilize, Understand, Design, Implement, and Manage) Prototyping, Prototypes at Different Scales  | 8             |
| 7.           | Storytelling, Developing the Story, Making Business Models Tangible, Scenario-Guided Business Model Design   | 2             |
| 8.           | Evaluating business models, business model perspective on blue ocean strategy, blending the blue ocean strategy framework with the business model canvas Managing multiple business models, Implementing Business Models in Organizations, Aligning IT with Business | 4             |
| <b>Total</b> |  | <b>42</b>     |

## 11. Suggested Books:

| <b>S.No.</b> | <b>Name of Authors/Book/Publisher</b>  | <b>Year of Publication / Reprint</b> |
|--------------|--|--------------------------------------|
| 1.           | Schultz, M and Doerr, J., “Professional services Marketing”, Wiley   | 2009                                 |
| 2.           | Lovelock, C., and Wirtz, J, “Essentials of Services Marketing”, Pearson Education  | 2008                                 |
| 3.           | Alexander Osterwalder and Yves Pigneur, “Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers”, Wiley                 | 2010                                 |
| 4.           | Adam J. Bock and Gerard George “The Business Model Book: Design, Build and Adapt Business Ideas that Drive Business Growth”, Pearson Education Limited | 2017                                 |
| 5.           | Raphael Amit and Christoph Zott, Business Model Innovation Strategy: Transformational Concepts and Tools for Entrepreneurial Leaders”, Wiley           | 2020                                 |

## INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

**NAME OF DEPARTMENT/CENTRE:** Department of Design

1. **Subject Code:** IMN-514                      **Course Title:** Financing and Marketing of Innovation
2. **Contact Hours:**        **L:** 3                                      **T:** 0                                      **P:** 0
3. **Examination Duration (Hrs.):**        **Theory:** 3                                      **Practical:** 0
4. **Relative Weightage:**    **CWS:** 20-35        **PRS:** 0        **MTE:** 20-30        **ETE:** 40-50        **PRE:** 0
5. **Credits:** 3                                      6. **Semester:** Spring                                      7. **Subject Area:** PCC
8. **Pre-requisite:** Nil
9. **Objective:** To impart knowledge on financing and marketing innovation effectively.

### 10. Details of the Course

| S.No.        | Contents   | Contact hours |
|--------------|--|---------------|
| 1.           | Sources of finance for financing innovation: Venture capital, Angel investors, Private equity and crowd funding etc.   | 8             |
| 2.           | Framework of financing innovation, Financing innovation at different stages, Financing Innovation in Emerging Markets  | 8             |
| 3.           | Marketing of Innovation, Types of Innovations from Marketing Science Perspective and common characteristics of High-Technology Environment, Value creation communication and delivery of Innovative Solutions. | 8             |
| 4.           | Value Capture with Innovative Solutions, Partnerships and Strategic Alliances in New Product Development   | 6             |
| 5.           | Marketing Research and Innovations, Marketing mix for innovations  | 6             |
| 6.           | Consumer Behaviour, Segmentation and Adoption Process, Strategic Market Planning in Innovative Firms   | 6             |
| <b>Total</b> |  | <b>42</b>     |

### 11. Suggested Books:

| S.No. | Name of Authors/Book/Publisher  | Year of Publication / Reprint |
|-------|---|-------------------------------|
| 1.    | Lourdes Casanova, Peter Klaus Cornelius and Soumitra Dutta, 'Financing Entrepreneurship and Innovation in Emerging Markets' Academic Press. | 2018                          |
| 2.    | Michael Kahn, Luiz Martins Melo, Marcelo G. P Matos 'Financing Innovation-BRICS National Systems of Innovation', Routledge India.           | 2017                          |
| 3.    | Cooper, R. G. 'Winning at New Products: Creating Value Through Innovation' New York: Basic Books, Fifth edition                             | 2017                          |
| 4.    | Eleonora Pantano, Clara Bassano, Constantinos-Vasilios Priporas, Technology, and Innovation for Marketing, Routledge                        | 2019                          |
| 5.    | Peter Doyle, Susan Bridgewater, Innovation in Marketing, Routledge  | 1999                          |

## INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

**NAME OF DEPARTMENT/CENTRE:** Department of Design

1. **Subject Code:** IMN-521                      **Course Title:** IP Portfolio Management
2. **Contact Hours:**                      **L:** 2                                      **T:** 1                                      **P:** 0
3. **Examination Duration (Hrs.):**                      **Theory:** 2                                      **Practical:** 0
4. **Relative Weightage:**    **CWS:** 20-35                      **PRS:** 0                      **MTE:** 20-30                      **ETE:** 40-50                      **PRE:** 0
5. **Credits:** 3                                      6. **Semester:** Autumn                                      7. **Subject Area:** PEC
8. **Pre-requisite:** Nil
9. **Objective:** To impart knowledge how to manage portfolio of IP in an organization.

### 10. Details of the Course

| S.No.        | Contents   | Contact hours |
|--------------|--|---------------|
| 1.           | Strategizing patent portfolio management: - Aligning IP strategy with R&D and business strategies, IP SWOT (strengths, weaknesses, opportunities and threats) analysis   | 4             |
| 2.           | Budgeting and organizing patent portfolio management: - General cost-saving measures; centralization of patent renewals and translations; monitoring-based countermeasures, Generation of inventions; invention portal; invention disclosure form; submission of inventions, Screening; novelty search; review processes, Invention assessment.  | 6             |
| 3.           | Patent filing strategies: - Priority filings: strategies, Further filings and country selection for patent granting strategies, ranking-based tiers strategies   | 6             |
| 4.           | Ensuring quality and extracting value from the patent portfolio: - Criteria for a valuable patent portfolio, identifying valuable patents: strategies for patent portfolio review; inventor review questionnaires, third party product searches, Patent intelligence tools i.e. Derwent Innovation Software, Analyzing and confirming value of identified patents: ranking systems; claim charting, dynamically adapting prosecution to value: ranking and target-based prosecution. | 6             |
| 5.           | Pruning the patent portfolio: - Monthly/yearly pruning, Pruning Recommendation Tool: criteria, scores, recommendations, Understanding the logic of strategy maps and balanced scorecards for IP management   | 6             |
| <b>Total</b> |  | <b>28</b>     |

### 11. Suggested Books:

| S.No. | Name of Authors/Book/Publisher   | Year of Publication / Reprint |
|-------|--|-------------------------------|
| 1.    | Brant Jennifer and Lohse Sebastian, Enhancing Intellectual Property Management and Appropriation by innovative SMEs, International Chamber of Commerce | 2013                          |
| 2.    | WIPO, Conceptual Study on Innovation, Intellectual Property and Informal Economy   | 2013                          |
| 3.    | Ian Ellis and Kenan Patrick Jarboe, Intangible assets in capital markets, Intellectual Asset Management  | 2010                          |

## INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

**NAME OF DEPARTMENT/CENTRE:** Department of Design

1. **Subject Code:** IMN-522                      **Course Title:** Intellectual Value and Corporate Value Creation
2. **Contact Hours:**                      **L:** 2                                      **T:** 1                                      **P:** 0
3. **Examination Duration (Hrs.):**                      **Theory:** 2                                      **Practical:** 0
4. **Relative Weightage:**    **CWS:** 20-35                      **PRS:** 0                      **MTE:** 20-30                      **ETE:** 40-50                      **PRE:** 0
5. **Credits:** 3                                      **6. Semester:** Autumn                                      **7. Subject Area:** PEC
8. **Pre-requisite:** Nil
9. **Objective:** To understand meaning of IP value, and how IP can contribute in corporate value creation.
10. **Details of the Course**

| S.No.        | Contents   | Contact hours |
|--------------|--|---------------|
| 1.           | Importance of IP for SMEs, Trademarks and Industrial Designs, Invention and Patent, Legal aspects of innovation & IP, Case study | 4             |
| 2.           | Trade Secrets, Copyright, Trademark, and other forms of IP; their importance and relevance                                       | 6             |
| 3.           | Technology Licensing in a Strategic Partnership, IP Licensing, Technology transfer agreement                                     | 6             |
| 4.           | Role of IP in digital economy, IP for identifying the business components, How IP recognizes the business opponent's             | 6             |
| 5.           | IP: National & International Trade, Valuation of IP Assets, IP Issues in Franchising.  | 6             |
| <b>Total</b> |  | <b>28</b>     |

### 11. Suggested Books:

| S.No. | Name of Authors/Book/Publisher  | Year of Publication / Reprint |
|-------|---|-------------------------------|
| 1.    | OECD "Creating Value from Intellectual Assets", Policy Report,, <a href="http://www.oecd.org/science/inno/36701575.pdf">http://www.oecd.org/science/inno/36701575.pdf</a> | 2007                          |
| 2.    | Zorina Kahn, IP Rights and Economic Development: A Historical Perspective", WIPO Magazine   | 2007                          |
| 3.    | John Henshall (Deloitte & Touché LLP, London), Supply chain restructuring: IP transfer pricing and taxation (four pages): BNA International                               | 2008                          |
| 4.    | Joshua S. Gans "The Value of IP Protection in Markets for Ideas" Australian Intellectual Property Law Bulletin, Vol.16, No.6,   | 2003                          |
| 5.    | WIPO, Valuation of Intellectual Property: What How and Why  | 2003                          |

## INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

**NAME OF DEPARTMENT/CENTRE:** Department of Design

1. **Subject Code:** IMN-523                      **Course Title:** Licensing and Commercialization of IP
2. **Contact Hours:**                      **L:** 2                                      **T:** 1                                      **P:** 0
3. **Examination Duration (Hrs.):**                      **Theory:** 2                                      **Practical:** 0
4. **Relative Weightage:**    **CWS:** 20-35                      **PRS:** 0                      **MTE:** 20-30                      **ETE:** 40-50                      **PRE:** 0
5. **Credits:** 3                                      **6. Semester:** Autumn                                      **7. Subject Area:** PEC
8. **Pre-requisite:** Nil
9. **Objective:** To impart knowledge about Licensing, Commercialization and Management of various Intellectual Properties such as patents, copyrights, trademarks, industrial designs geographical designs etc.

### 10. Details of the Course

| S.No.        | Contents  | Contact hours |
|--------------|---|---------------|
| 1.           | Intellectual Property (IP): Discoveries, Innovations and Inventions; Invention v/s Innovation; Types of IP Rights; Single and Multiple IPR for a Product.   | 2             |
| 2.           | Patent IPs: Patentee, Inventor and Assignee; The Indian Patent Act (1970) as Amended in 2005; Patentable Work and Not Patentable Work; Categories of Inventions Not Patentable in India; Patenting in India, Patenting Outside India.   | 3             |
| 3.           | SEP: IPR and Standards and their Compliance, Standard Development Organizations (SDOs) and their Role during and after Standardization; Standard and Essential Patents (SEP), their interface, particularly with engineering and technology; their preparation; the rights of owners and users of SEP         | 4             |
| 4.           | IP Law and Competition Law and its importance for information and communication technology (ICT); Cases of anti-competitive behaviour by SEP holder; FRAND its concept, significance and importance; FRAND licencing and its applications with examples for Internet of Things (IoT), 5G and other technology | 4             |
| 5.           | Agreements for IPs: Types of Agreements; Licensing Agreements; Non-Discloser Agreements; Technology-Transfer Agreements; Joint Venture Agreements; Franchising Agreements   | 4             |
| 6.           | Licenses for Various IPs: License and Compulsory License, Patent Licenses, Know-How and Trade Secret Licenses, Trademark Licenses, Copyright Licenses; Time duration to initiate licencing and strategies   | 4             |
| 7.           | Analysis for Commercialization of IP: Use or Lose IP!; Time duration to initiate commercialization and strategies; Market Analysis, IP Audit, IP Valuation  | 4             |
| 8.           | Commercialization and Royalty on IP: Financing and Capital through IPR, Branding, Advertising and Marketing; Commercializing IP; Royalty on IP.   | 3             |
| <b>Total</b> |   | <b>28</b>     |

## 11. Suggested Books:

| <b>S.No.</b> | <b>Name of Authors/Book/Publisher</b>   | <b>Year of Publication / Reprint</b> |
|--------------|---|--------------------------------------|
| 1.           | Stoianoff NP, Chilton F, Monotti AL, Giles K (Lawyer), Harris JR; Commercialisation of Intellectual Property, Lexis Nexis Butterworths. | 2019                                 |
| 2.           | McManus, JP; Intellectual Property: From Creation to Commercialisation; Oak Tree Press  | 2012                                 |
| 3.           | Richard Raysman R, Pisacreta EA, Adler KA, Ostrow SH; Intellectual Property Licensing: Forms and Analysis; Law Journal Press            | 2021                                 |
| 4.           | Nikolic, Igor Licensing Standard Essential Patents, FRAND and the Internet of Things; Zed Books   | 2021                                 |
| 5.           | Petrovic, Urska Competition Law and Standard Essential Patents; Kluwer Law International  | 2014                                 |