

# **UNIVERSITY OF DELHI**



**Department of Home Science**

**Faculty of Science**

**Post Graduate Programmes**

**Course Credit Structure-CBCS**

**2018**

The **Department of Home Science** offers the following Post Graduate Programmes:

**Masters Programmes in –**

M.Sc. Food & Nutrition

M.Sc. Human Development & Childhood Studies

M.Sc. Development Communication & Extension

**M.Sc. Resource Management & Design Application**

M.Sc. Fabric & Apparel Science

**Post Graduate Diploma Programmes in-**

Post Graduate Diploma in Dietetics & Public Health Nutrition

Post Graduate Diploma in Health and Social Gerontology

**M.Sc. Resource Management and Design Application**  
**Department of Home Science**  
**University of Delhi**

**Course Credit Structure-CBCS**

**2018**

## PG Admission Eligibility

### PART I Candidates seeking admission through entrance examination

<b>8 A</b>	<b>M.Sc. course in Food &amp; Nutrition:</b>	<b>Intake Capacity: 21</b>
	B.Sc. (Hons.) in Home Science / B.Sc. (Pass) in Home Science / B.Sc (Hons.) in Food Technology: after (10+2)/ PGDDPHN (1 yr), from Delhi University or any other University whose Examination is recognized by the University of Delhi as equivalent and fulfill other conditions of eligibility. Should have passed Nutritional Biochemistry and any two subjects in the following areas: Food & Nutrition / Nutrition through the life cycle / Public Nutrition / Food Science and Processing / Diet therapy / Microbiology/ Nutrition for Adults and Elderly/ Nutrition for Children and Adolescents	<b>ELIGIBILITY CONDITIONS</b> 55% or above marks in aggregate in Home Science or Food Technology or equivalent grade points.
<b>8 B</b>	<b>M.Sc. course in Human Development and Childhood Studies:</b>	<b>Intake Capacity: 11</b>
	B.Sc. (Hons.) in Home Science / B.Sc. (Pass) in Home Science: after (10+2), from Delhi University or any other University whose Examination is recognized by the University of Delhi as equivalent and fulfill other conditions of eligibility. Should have passed any three subjects in the following areas: Introduction to Human Development / Socio-cultural Dimensions of family in India / Foundations of Human Development: Theories and Principles / Gender Empowerment and Justice / Human Development: Lifespan / Child Rights & Social Action	<b>ELIGIBILITY CONDITIONS</b> 55% or above marks in aggregate in Home Science or equivalent grade points.
<b>8 C</b>	<b>M.Sc. course in Resource Management and Design Application:</b>	<b>Intake Capacity: 11</b>
	B.Sc. (Hons.) in Home Science / B.Sc. (Pass) in Home Science: after (10+2) from Delhi University or any other University whose Examination is recognized by the University of Delhi as equivalent and fulfill other conditions of eligibility. Should have passed any three subjects in the following areas: Resource Management / Family Finance & Consumer Studies / Housing and Space Design / Ergonomic in Design Development /Interior Design and Decoration/ Entrepreneurship and Enterprise Management / Resources and Sustainable Development / Human Resource Management	<b>ELIGIBILITY CONDITIONS</b> 55% or above marks in aggregate in Home Science or equivalent grade points.

<b>8 D</b>	<b>M.Sc. course in Development Communication and Extension:</b>	<b>Intake Capacity: 11</b>
	B.Sc. (Hons.) in Home Science / B.Sc. (Pass) in Home Science: after (10+2) from Delhi University or any other University whose Examination is recognized by the University of Delhi as equivalent and fulfill other conditions of eligibility. Should have passed any three subjects in the following areas: Communication and Extension / Gender and Development / Media Systems / Mass Communication / Sustainable Development/ Training and Development/Extension Programme Design and Management/ Development Communication and Journalism / Training and Development	<i>ELIGIBILITY CONDITIONS</i> 55% or above marks in aggregate in Home Science or equivalent grade points.
<b>8 E</b>	<b>M.Sc. course in Fabric and Apparel Science:</b>	<b>Intake Capacity: 19</b>
	B.Sc. (Hons.) in Home Science / B.Sc. (Pass) in Home Science: after (10+2) from Delhi University or any other University whose Examination is recognized by the University of Delhi as equivalent and fulfill other conditions of eligibility. Should have passed any three subjects in the following areas: Fundamentals of Fabric and Apparel Science / Fabric Science / Indian Textile Heritage / Apparel Construction / Applied Textile Design / Dyeing and Printing / Design Concepts / Fashion Design Development / Fashion Studies	<i>ELIGIBILITY CONDITIONS</i> 55% or above marks in aggregate in Home Science or equivalent grade points.

**PART II (FORM B) Candidates seeking admission on merit on the basis of marks obtained in the B.Sc. (Hons) Home Science, University of Delhi in the year in which admission is sought**

<b>7 A</b>	<b>M.Sc. course in Food &amp; Nutrition:</b>	<b>Intake Capacity: 20</b>
	B.Sc. (Hons.) in Home Science: Food & Nutrition (3 years course) after (10+2) from Delhi University only.	<i>ELIGIBILITY CONDITIONS</i> 60% or above marks in aggregate or equivalent grade points in Home Science (Hons.) with specialization in Food and Nutrition
<b>7 B</b>	<b>M.Sc. course in Human Development and Childhood Studies:</b>	<b>Intake Capacity: 11</b>
	B.Sc. (Hons.) in Home Science: Human Development (3 years course) after (10+2) from Delhi University only.	<i>ELIGIBILITY CONDITIONS</i> 60% or above marks in aggregate or equivalent grade points in Home Science (Hons.) with specialization in Human Development

<b>7 C</b>	<b>M.Sc. course in Resource Management and Design Application:</b>	<b>Intake Capacity: 11</b>
	B.Sc. (Hons.) in Home Science: Resource Management (3 years course) after (10+2) from Delhi University only.	<i>ELIGIBILITY CONDITIONS</i> 60% or above marks in aggregate or equivalent grade points in Home Science (Hons.) with specialization in Resource Management
<b>7 D</b>	<b>M.Sc. course in Development Communication and Extension:</b>	<b>Intake Capacity: 11</b>
	B.Sc. (Hons.) in Home Science: Communication and Extension (3 years course) after (10+2) from Delhi University only.	<i>ELIGIBILITY CONDITIONS</i> 60% or above marks in aggregate or equivalent grade points in Home Science (Hons.) with specialization in Communication and Extension
<b>7 E</b>	<b>M.Sc. course in Fabric and Apparel Science:</b>	<b>Intake Capacity: 18</b>
	B.Sc. (Hons.) in Home Science: Fabric and Apparel Science (3 years course) after (10+2) from Delhi University only.	<i>ELIGIBILITY CONDITIONS</i> 60% or above marks in aggregate or equivalent grade points in Home Science (Hons.) with specialization in Fabric and Apparel Science

**Eligibility for reserved categories will be as per University guidelines.**

For details concerning University guidelines visit [www.du.ac.in](http://www.du.ac.in)

The department of home science offers master's programme in Resource Management & Design Application. This master's programme strives at empowerment through knowledge and skills towards management of personal, family, community and shared resources for creation of sensitive, aesthetic and sustainable environment. The programme strives to build a cadre of professionals in the area of sustainable management of resources and new product development. The courses are pitched at providing a strong theoretical base along with skill enhancement through hands-on training. The curriculum provides experiential training to students for professional and career readiness which enables students to participate in real life projects and develop the right skill set needed in a competitive market scenario.

**Programme Specific Objectives:**

- To build a cadre of professionals in the area of sustainable management of resources and new product development.
- To provide a strong theoretical base along with skill enhancement through hands-on training.
- To provide experiential training to students for professional and career readiness which enables students to participate in real life projects and develop the right skill set needed in a competitive market scenario.
- To train students to work in the areas of research, consultancy, programme, design, management and evaluation in various research and social development organizations

**Programme Specific Outcomes:**

- Professional and career readiness through participation in real life projects and develop the right skill set needed in a competitive market scenario.
- Enhanced entrepreneurial spirit through sounder management of facilities, marketing, finance and project management.
- Proficiency in various computer aided softwares along with design simulation thus giving a professional edge.
- Expertise in designing space and products using ergonomic, sustainable, economically and socio-culturally viable solutions with focus on life-cycle assessment approach.
- Proficiency in policies, practices and technologies for sustainable use of resources integrated with various dimensions and frameworks of environment management.

## COURSE CREDIT SCHEME

**Total Credits: 100**

**Total No. of Core Papers: 15**

**Total No. of Electives: 05**

**Total No. of Open Electives: 01**

Semester	Core Courses			Elective Course			Open Elective Course			Total Credits
	No. of papers	Credits (L+T/P)	Total Credits	No. of papers	Credits (L+T/P)	Total Credits	No. of papers	Credits (L+T/P)	Total Credits	
I	4	16L+6T/P	<b>20</b>							<b>20</b>
II	5	16L+8 T/P	<b>24</b>							<b>24</b>
III	5	8L+ 8P	<b>16</b>	2	8L+ 4P	<b>12</b>	1	4	<b>4</b>	<b>32</b>
IV	1	4	<b>6</b>	3	12L +6P	<b>18</b>				<b>24</b>
<b>Total Credits for the Course</b>			<b>66</b>			<b>30</b>			<b>4</b>	<b>100</b>

**\* Student must clear 100 credits.**



<b>SEMESTER I</b>				
<b>Number of core courses</b>	<b>Credits in each core course</b>			
Course	Theory	Practical	Tutorial	Credits
Core Course 1 CC101: Research Methods	4			4
Core Course 2 RMDACC102: Project Management	4	2		6
Core Course 3 RMDACC103: Building Design and Strategies	4	2		6
Core Course 4 RMDACC104: Financial Management & Accountancy	4			4
Total credits in core course	20			
<b>Total credits in Semester I      20</b>				
<b>SEMESTER II</b>				
<b>Number of core courses</b>	<b>Credits in each core course</b>			
Course	Theory	Practical	Tutorial	Credits
Core course 5 CC205: Statistics & Computer Applications	4	2		6
Core course 6 RMDACC206: Consumer Behaviour & Marketing Management	4	2		6
Core course 7 RMDACC207: Sustainability Reporting & Corporate Social Responsibility	4			4
Core course 8 RMDACC208: Facilities & Services Management	4			4
Core course 9 Integrated Practical RMDACC209: (a) Facilities & Service Management (b) Economic Empowerment of Communities		4 (2+2)		4
Total credits in core course	24			
<b>Total credits in Semester II      24</b>				

<b>SEMESTER III</b>				
<b>Number of core courses</b>	<b>Credits in each core course</b>			
Course	Theory	Practical	Tutorial	Credits
Core course 10 RMDACC310: Enterprise Design & Management	4			4
Core course 11 RMDACC311: Visual Merchandising and Display	4			4
Core course 12 Integrated Practical RMDACC312: (a) Enterprise Design & Management (b) Visual Merchandising and Display		4 (2+2)		4
Core course 13 RMDACC313: Internship		2		2
Core course 14 RMDACC314: Dissertation I: Technical Writing & Seminar		2		2
<b>Total credits in core course</b>	<b>16</b>			
<b>Number of elective courses</b>	<b>Credits in each Elective course</b>			
Credits in each elective course	Theory	Practical	Tutorial	Credits
RMDAEC31A/B: Elective course 1	4	2		6
RMDAEC32A/B: Elective course 2	4	2		6
<b>Total credits in elective courses</b>	<b>12</b>			
<b>Number of Open Electives</b>	<b>Credits in each open elective</b>			
	Theory			Credits
Open Elective	4			4
Total credits in open elective	4			
<b>Total credits in Semester III</b>	<b>32</b>			

**Elective Courses: Select any one specialization of the following:**

- **Specialization A: Space & Product Design**  
RMDAEC31A: Product Design & Development  
RMDAEC32A: Advanced Space Design & Ecology
- **Specialization B: Environment Management & Sustainable Development**  
RMDAEC31B: Sustainable Habitat Concept & Practices  
RMDAEC32B: Capacity Building for Sustainable Development

**Open Elective Courses for Semester III - Select any one of the following:**

- FNOE31 : Community Nutrition Assessment
- HDCSOE31 : Parenting & High Risk Infants
- DCEOE31 : Communication Processes and Techniques
- RMDAOE31 : Entrepreneurship & Innovation
- FASOE31: Fabric Study

<b>SEMESTER IV</b>				
<b>Number of core courses</b>	<b>Credits in each core course</b>			
Course	Theory	Practical	Tutorial	Credits
Core course 15 RMDACC415: Dissertation II /Experiential Learning Project		6		6
Total credits in core course	6			
<b>Number of elective courses</b>	<b>Credits in each Elective course</b>			
Credits in each elective course	Theory	Practical	Tutorial	Credits
RMDAEC41A/B: Elective course 3	4	2		6
RMDAEC42A/B: Elective course 4	4	2		6
RMDAEC43A/B: Elective course 5	4	2		6
Total credits in elective courses	18			
<b>Total credits in Semester IV 24</b>				

**Elective Courses: Select any one specialization of the following:**

- **Specialization A: Space & Product Design**
  - RMDAEC41A: Design Clinic & Audit
  - RMDAEC42A: Ergonomics: Human Centred Design
  - RMDAEC43A: Professional Practices in Design & Start-ups
  
- **Specialization B: Environment Management & Sustainable Development (any 3)**
  - RMDAEC41B: Policies & Practices for Sustainable Development
  - RMDAEC42B: Climate Change & Ecosystem: Issues & Concerns
  - RMDAEC43B: Health & Safety in Built Environment

## **SEMESTER I**

# CC101: RESEARCH METHODS THEORY

Marks: 100

Duration: 3 Hrs.

## Course objectives:

To provide students understandings about the basic concepts, approaches and methods in conducting research thereby enabling them to appreciate and critique the nuances of designing a research study as well the ethical dimensions of conducting researches.

## Course Learning Outcomes:

Student will be able to:

1. Demonstrate knowledge of the scientific method, purpose and approaches to research
2. Compare and contrast quantitative and qualitative research
3. Explain research design and the research cycle
4. Prepare key elements of a research proposal
5. Explain ethical principles, issues and procedures

## CONTENTS

## PERIODS

### UNIT I: Purpose of research

10

- Definition, objectives and significance of research
- Types of research
- Scientific method: induction and deduction
- Research approaches: quantitative, qualitative and mixed
- Issues of relevance and cultural appropriateness

### UNIT II: Principles of Research in quantitative and qualitative approaches

30

#### *Research design*

- Meaning and need of research design
- Components and types of research design
- Issues in design construction

#### *Sampling, methods*

- Concept of sampling, key differences in the two approaches
- Sampling methods, sample size and sampling error
- Selecting participants and contexts to examine social phenomenon

#### *Data collection and analyses*

- Methods and measurement: Measurement in research, scales and errors in measurement, reliability and validity of measurement tools
- Methods of data collection and types of data
- Immersion, deep engagement, triangulation and reflexivity in qualitative data collection
- Data management and quality control
- Transcription in qualitative data analyses
- Errors in inference – Bias and confounding, reliability and validity issues
- Ensuring reliability and validity in qualitative research

### UNIT III: The Research Cycle

12

- Systematic literature review and referencing
- Formulating a research problem –Developing research questions and objectives, exploring research context/phenomenon
- Identifying variables, constructing hypotheses
- Deciding research approach and design
- Selection of sample/participants, choice of methods and analysis.
- Writing a research report-Styles and format.

### UNIT IV: Values, Social Responsibility and Ethics in Research

8

- Ethical principles guiding research: from inception to completion and publication of research
- Ethical issues relating to research participants and the researcher
  - Rights, dignity, privacy and safety of participants
  - Informed consent, confidentiality anonymity of respondents, voluntary participation, harm avoidance
  - Conflicts of interest or bias, Use of inappropriate research methodology, Incorrect reporting, misuse of information

#### Teaching Plan:

**Week 1:** Definition, objectives and significance of research

**Week 2:** Types of research, Scientific method: induction and deduction

**Week 3 :** Research approaches: quantitative, qualitative and mixed. Issues of relevance and cultural appropriateness

**Week 4:** Meaning and need of research design; types of research design, issues in design construction

**Week 5:** Concept of sampling, key differences in the two approaches, Selecting participants and contexts to examine social phenomenon

**Week 6:** Sampling methods, Sample size and sampling error

**Week 7:** Measurement in research, scales and errors in measurement, reliability and validity of measurement tools

**Week 8:** Methods of data collection and types of data, Immersion, deep engagement, triangulation and reflexivity in qualitative data collection

**Week 9:** Data management and quality control; Transcription in qualitative data analyses

**Week 10:** Errors in inference – Bias and confounding, reliability and validity issues; Ensuring reliability and validity in qualitative research

**Week 11:** Research Cycle and writing research report

**Week 12:** Ethics in Research

#### Facilitating the achievement of Course Learning Outcomes:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1.	Demonstrate knowledge of the scientific method,	Unit transaction through power	Assignments,

	purpose and approaches to research.	point presentations	Open book test
2.	Compare and contrast quantitative and qualitative research	Unit transaction through power point presentations and classroom discussion about review and critique of journal articles	Quizzes and objective test
3.	Explain research design and the research cycle	Unit transaction through power point presentations and classroom discussion using research case studies	Assignments, Open book test
4.	Prepare key elements of a research proposal	Unit transaction through power point presentations Students to develop a live research project in groups	Assignments, Open book test Assessment of live project
5	Explain ethical principles, issues and procedures	Unit transaction through power point presentations and classroom discussion about research proposals	Class assignments and quizzes

### Suggested Readings:

- Aschengrau A, Seage III GR. (2014) *Essentials of Epidemiology in Public Health*. (Third Edition). Sudbury, MA: Jones & Bartlett.
- Bell, J. (1999). *Doing your research project: Guide for first time researchers in social sciences*. New Delhi: Viva Books.
- Bernard, H. R. (2000). *Social research methods: Qualitative and quantitative approaches*. Thousand Oaks, CA.: Sage.
- Blaxter, L. Hughes, C., & Tight, K. (1999). *How to research*. New Delhi: Viva Books.
- Bryman, A. (2008). *Social research method*. Oxford: Oxford University Press.
- Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, CA: Sage Publications.
- Denscombe, M. (1999). *The good research guide for small-scale social research projects*. New Delhi: Viva Publications.
- Denzin, N. and Lincoln, Y. (Eds.) 2005. *The Sage handbook of qualitative research*. London: Sage.
- Gordis L. (2013) *Epidemiology*. (Fifth Edition). Philadelphia, PA: Saunders Elsevier
- Kerlinger, F. N, & Lee, H. B. (2000). *Foundations of behavioral research*. Belmont, Calif.: Wadsworth.
- Miles, M. & Huberman, M. (1994). *Qualitative data analysis: An expanded sourcebook*. London: Sage.



- Rothman K. (2002) *Epidemiology – An Introduction*. New York. NY: Oxford University Press.

**RMDACC102: PROJECT MANAGEMENT  
THEORY**

**Marks: 100**

**Duration: 3 Hrs.**

**Course Objectives:**

The purpose of this course is to introduce students to the world of projects and to projects' real life struggles and challenges. It will broadly cover the operational and conceptual issues faced by modern project managers. At the end of this course, students should be able to develop, execute, and control a basic project plan.

**Course Learning Outcomes:**

After completing this course, students will:

1. Understand the role of the project manager in an organization, and ways of structuring organizations to manage projects
2. Understand the range, scope, and complexity of modern projects
3. Develop a strategic, system perspective on the management of projects
4. Learn to apply modern project management tools and techniques

**CONTENTS**

**PERIODS**

**UNIT I: Introduction to Project Management**

**8**

- Project Selection
- Measuring Project Success

**UNIT II: The Project Manager**

**10**

- Role and Negotiation
- Ethics
- Conflict management

**UNIT III: Project Organization**

**15**

- Planning, Budgeting
- Cost Estimation
- Risk management

**UNIT IV: Project Monitoring and control**

**15**

- Scheduling
- Resource Allocation
- Leveling

- Auditing and Termination

**Suggested Readings:**

- A guide to the Project Management Body of Knowledge- PMBOK Guide-Fourth Edition, American National Standard, ANSI/PMI99-001-2008
- A Guide to the Project Management Body of Knowledge, 5th Edition by the Project Management Institute (PMI) 2013. ISBN: 9781935589679
- Elements of Project Management, Pete Spinner, Prentice Hall, USA
- Project Management: A Managerial Approach, 9th Edition by Jack R. Meredith, Samuel J. Mantel, Jr. and Scott M. Shafer ISBN 9781119071983 ©2015 (M&M)
- Project Management-Prasanna and Chandra, Tata McGraw Hill

**Teaching Plan:**

**Week 1:** Project Selection

**Week 2:** Measuring Project Success

**Week 3:** The Project Manager - Role and Negotiation

**Week 4:** Ethics

**Week 5:** Conflict management

**Week 6:** Planning, Budgeting

**Week 7:** Cost Estimation

**Week 8:** Risk management

**Week 9:** Scheduling

**Week 10:** Resource Allocation

**Week 11:** Leveling

**Week 12:** Auditing and Termination and Revision

**Facilitating the achievement of Course Learning Outcomes:**

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Understand the role of the project manager in an organization, and ways of structuring organizations to manage projects	Unit transaction through power point presentations	Assignments, Open book test
2	Understand the range, scope, and complexity of modern projects	Unit transaction through power point presentations Students to work on a live research project in groups	Class assignments and quizzes
3	Develop a strategic, system perspective on the management of projects	Unit transaction through power point presentations and classroom discussion	Class assignments and quizzes

		using case studies	
4	Learn to apply modern project management tools and techniques	Unit transaction through power point presentations and classroom discussion	Class assignments and quizzes

**RMDACC102: PROJECT MANAGEMENT  
PRACTICAL**

**Marks: 50**

**Duration: 3 Hrs**

**Course Objectives:**

This course is designed to deepen the student's ability to use various project management tools for planning, controlling and monitoring a project. A set of instruments for risk analysis and decision making under uncertainty, a simulation program for managing projects, are used throughout the course, allowing students to get familiar with industry tools for managing project risk.

**Course Learning Outcomes:**

After completing this course, the student will be able to:

1. Build project portfolio selection models.
2. Identify and analyze project risks and develop contingency plans for those risks.
3. Analyze the impact of variability in project tasks and plans.
4. Select the most appropriate resources to maintain the schedule and budget of a project.

**CONTENTS**

**PERIODS**

UNIT I: Decision tools	8
UNIT II: Project selection: EMV, Precision Tree	8
UNIT III: Portfolio optimization	6
UNIT IV: Schedule and cost risk	6
UNIT V: Cost management: time/cost trade-off	6
UNIT VI: Developing RFPs	6
UNIT VII: Resource management: resource allocation, resource leveling	8

The above practicals will be conducted using latest tools like PRIMAVERA, MS Project etc.

**Suggested Readings:**

- Horine, G. (2012). *Project Management Absolute Beginner's Guide (3rd Edition)*.
- Kerzner, H. (2013). *Project Management: A Systems Approach to Planning, Scheduling, and Controlling 11th Edition*.
- Roberts, P. (2013). *Guide to Project Management: Getting it right and achieving lasting benefit*.

- Schmidt, T. (2009). *Strategic Project Management Made Simple: Practical Tools for Leaders and Teams*.

## **RMDACC103: BUILDING DESIGN & STRATEGIES THEORY**

**Marks: 100**

**Duration: 3 Hrs.**

### **Course Objectives:**

This course focuses on providing in-depth understanding about concepts, processes and techniques pertaining to planning and design of buildings. It takes into account both conventional and contemporary methods of design and explores the best design practices employed for designing comfortable spaces.

### **Course Learning Outcomes:**

After completing this course, students will be able to:

1. Identify the basic concepts pertaining to planning & design of buildings
2. Learn application of building bye-laws in designing buildings
3. Discover prudent use of conventional and contemporary building materials
4. Use resource efficient methods and techniques for building design and enhancing occupants' comfort
5. Understand human habitation as part of the eco-system
6. Develop a holistic understanding of human settlements and their socio-cultural aspects
7. Adapt traditional knowledge systems & vernacular architecture for optimizing building efficiency

## **CONTENTS**

## **PERIODS**

### **UNIT I: Understanding concepts in Space planning and Design**

**12**

- Site selection & orientation of buildings
- Structural components of a building terminology with respect to climatology construction: foundation, floor, roof, columns, beam, walls, doors & windows, partitions & paneling, staircase, false ceiling
- Understanding building sustainability with respect to economic, physical, environmental and social components
- Latest building bye-laws & codes of practice: NBC and MPD
- Physical Planning and Zoning- concept of land use, zoning and neighborhood

### **UNIT II: Building Resources**

**20**

- Building Materials
  - Lifecycle assessment of building materials: Rethinking waste minimization through processes of reduction, recovery, recycling, reuse, storage and disposal of construction waste, evaluation criteria for eco-friendly building materials and its use
  - Environmental impact of building materials

- Resource efficiency
  - Resource efficiency of building materials
  - Indices of indoor comfort
  - Passive building design
  - Energy efficient building design and rethinking techniques (HVAC, energy efficient lighting systems, water efficient systems)

### **UNIT III: Understanding Human Settlements and Designing for Human Adaptation 16**

- Concept and characteristics of human settlements
- Factors impacting human settlements and its ecology
- Socio-cultural aspects of human settlement
- Sociology of housing and settlement structure
- Traditional building structures, knowledge systems and techniques
- Vernacular architecture: local materials and resources

#### **Suggested Readings:**

- Kumar, S. (2010). *Building construction* (20th ed.). New Delhi, India: Standard and Distributors. (Unit 1)
- *National Building Code of India*. (2016). Bureau of Indian Standards. (Unit 1)
- Neufert, Ernst. *Architect's Data*. 3rd ed., Blackwell Publishing, 2008. (Unit 1 & 2)
- Punmia, B. C., Jain, A. K., & Jain, A. K. (2008). *Building Construction* (10th ed.). New Delhi, India: Laxmi Publications. (Unit 1)
- Tipnis, A. (2012). *Vernacular Traditions: Contemporary Architecture*. The Energy and Resources Institute. (Unit 3)
- Varghese, P. C. (2015). *Building materials* (2nd ed.). New Delhi: PHI Learning Private Limited. (Unit 2)

#### **Teaching Plan:**

**Week 1:** Unit 1: Application of concepts in Space planning and Design, Site selection and building orientation, Structural components terminology: foundation, floor

**Week 2:** Unit 1: Application of concepts in Space planning and Design, Structural components terminology: roof and ceiling, walls, doors, Understanding building sustainability

**Week 3:** Unit 1: Application of concepts in Space planning and Design, Latest building bye-laws & codes of practice: NBC and MPD, Physical Planning and Zoning- concept of land use, zoning and neighborhood

**Week 4:** Unit 2: Building Resources, Lifecycle assessment of building materials: Waste minimization through processes of reduction, recovery, recycling, reuse, storage and disposal of construction waste, evaluation criteria for eco-friendly building materials and its use

**Week 5:** Unit 2: Building Resources, Evaluation criteria for eco-friendly building materials and its use, Environmental impact of building materials

**Week 6:** Unit 2: Building Resources, Resource efficiency of building materials, Indices of indoor comfort

**Week 7:** Unit 2: Building Resources, Passive building design, Energy efficient building design techniques

**Week 8:** Unit 2: Building Resources, HVAC, Daylight and energy efficient lighting

**Week 9:** Unit 3: Designing for Human Adaptation, Concept and characteristics of human settlements, Factors impacting human settlements and its ecology

**Week 10:** Unit 3: Designing for Human Adaptation, Socio-cultural aspects of human settlement, Sociology of housing and settlement structure

**Week 11:** Unit 3: Designing for Human Adaptation, Traditional building structures, knowledge systems and techniques

**Week 12:** Unit 3: Designing for Human Adaptation, Vernacular architecture: local materials and resources

**Facilitating the achievement of Course Learning Outcomes:**

Unit No.	Course Learning Outcomes	Teaching & Learning Activity	Assessment Tasks
1	<ul style="list-style-type: none"> <li>Identify the basic concepts pertaining to planning &amp; design of buildings</li> <li>Learn application of building bye-laws in designing buildings</li> </ul>	Classroom lectures and power-point presentations will be the primary teaching mode for understanding basic concepts in building design and application of building bye-laws.	<p>Short assignment on structural components of a building</p> <p>Quiz on latest building bye-laws</p>
2	<ul style="list-style-type: none"> <li>Discover prudent use of conventional and contemporary building materials</li> <li>Use resource efficient methods and techniques for building design and enhancing occupants' comfort</li> </ul>	<p>Classroom lectures and power-point presentations will be used for understanding use of conventional and contemporary building materials and resource efficiency.</p> <p>Students will also be shown different building materials accompanied by discussions for their identification, properties and use</p>	<p>Test on resource efficiency</p> <p>Spotting and Quiz for identification of building materials</p>
3	<ul style="list-style-type: none"> <li>Understand human habitation as part of the eco-system</li> <li>Develop a holistic understanding of human settlements and their socio-cultural aspects</li> <li>Adapt traditional knowledge systems</li> </ul>	<p>Classroom lectures and power-point presentations will be used for understanding the basics of designing for human adaptation.</p> <p>Videos will be shown to the students to educate them about human</p>	<p>Case study assignment on different types of human settlements and their socio-economic aspects</p> <p>Short assignment on traditional knowledge systems &amp; vernacular</p>

	& vernacular architecture for optimizing building efficiency	settlements and vernacular architecture  Students will also be taken on field to give them hands-on exposure	architecture
--	--	--	--------------

**RMDACC103: BUILDING DESIGN & STRATEGIES  
PRACTICAL**

**Marks: 50**

**Duration: 3 Hrs.**

**Course Objectives:**

This practical focuses on development of presentation and layout plans for identifying various resources and designing efficient spaces. It also explores the integration of traditional design techniques with contemporary methods for creating comfortable living spaces.

**Course Learning Outcomes:**

After completing this course student will be able to:

1. Construct resource maps of different areas
2. Draft layout plans and elevations
3. Evaluate use of traditional and contemporary building materials
4. Generate case-profiles of settlement structures & energy efficient buildings
5. Develop a project on vernacular architecture

**CONTENTS**

**PERIODS**

**UNIT 1: Drafting layout plans & elevations**

**24**

- Understanding dimensioning through use of metric and architectural scale
- Understanding master plans, zoning and neighborhood plans: Resource Mapping
- Constructing layout plan & elevation of residential interior spaces

**UNIT 2: Case Profiling**

**12**

- Case profile of settlement structures (modern and traditional) to study socio-cultural aspects
- Case profile of energy efficient construction technologies and high performance buildings

**UNIT 3: Survey: Building Materials**

**6**

- Assessing conventional and contemporary building materials in terms of their identification, costing, characteristics, resource efficiency, environmental impact and application
- Survey on energy efficient building materials

**UNIT 4: Project**

**6**

- Exploring best practices and knowledge systems of vernacular architecture and generating drawings of its varied components

**Suggested Readings:**

- Hall, M. (2016). *Materials for Energy Efficiency and Thermal Comfort in Buildings*. S.L.: Woodhead.
- *Master plan for Delhi: With the perspective for the year 2021*. (2007). New Delhi: Rupa & Co.
- Punmia, B. C., Jain, A. K., & Jain, A. K. (2008). *Building Construction* (10th ed.). New Delhi, India: Laxmi Publications.
- Tipnis, A. (2012). *Vernacular Traditions: Contemporary Architecture*. The Energy and Resources Institute.
- Varghese, P. C. (2015). *Building materials* (2nd ed.). New Delhi: PHI Learning Private Limited.

## **RMDACC104: FINANCIAL MANAGEMENT & ACCOUNTANCY THEORY**

**Marks: 100**

**Duration: 3 Hrs.**

### **Course Objectives:**

To provide basic knowledge regarding multiple accounting and financial aspects to students.

### **Course Outcomes:**

1. Knowledge about principles and techniques of accounting information for decision-making and control
2. Acquire skills in the use of tools, techniques and processes of financial management in the realm of financial decision-making

### **CONTENTS**

### **PERIODS**

#### **UNIT I: Introduction to financial accounting and financial management**

**10**

- Concept, nature, and scope of financial accounting
- Financial accounting – generally accepted accounting principles (GAAP)
- Accounting process and system- journal, ledger & trial balance
- Cost accounting and Management accounting
- Objectives, nature and scope of financial management

#### **Unit II: Financial Statements & tools of financial analysis**

**15**

- Nature, functions & limitations of various financial statements
- Preparations of Profit and Loss accounts and Balance sheets
- Long term Assets and Depreciation / Inventory
- Tools of financial analysis: Fund flow analysis and Cash flow analysis, Ratio analysis, Cost volume profit (break-even) analysis, Analysis of operating and financial leverages

#### **Unit III: Cost accounting**

**15**

- Costing fundamentals: Cost concepts & classifications, Materials, Direct Labor and Direct Expenses, Overheads general, Overheads Distributions
- Costing for Specific Industries: Single or Output costing, Job, Batch and Contract costing, Process Costing, Operating costing



- Costing for Control: Budgetary control, Standard costing & Variance analysis, Marginal costing & Cost volume profit analysis

#### **UNIT IV: Financial planning**

**20**

- Raising long term funds: Planning capital structure, Internal financing, Issue of bonus shares, Rights Shares, Rights Debentures, Capital Budgeting, Cost of Capital
- Managing short term finance: Management of Working capital, Management of Inventories

#### **Suggested Readings:**

- Anthony, A. (2001). *Management Accounting*. London: Prentice Hall
- Bhattacharya, A. K. (2007). *Essentials of Financial Accounting*. PHI, New Delhi.
- Chandra, P. (2001). *Financial Management: Theory and Practice*. New Delhi: Tata McGraw Hill Publishing
- Damodaran, A. *Corporate Finance: Theory and Finance*. New York: John Wiley
- Ghosh. T. P. (1998). *Accounting and Finance for Managers*. Taxman, 1st Edition.
- Horngren, Charles T. (2001). *Introduction to Management Accounting*. New Delhi: Prentice hall of India Private Ltd
- Kimmel. P.D, (2000). *Financial Accounting: Tools for Business Decisions Making*. New York: John Wiley & Sons
- Maheshwari S.N. & Maheshwari S. K. (2007). *An Introduction to Accountancy*. Vikas, 9th Edition.
- Mukherjee. (2009). *Financial Accounting for Management*. TMH, 1st Edition.
- Ramchandran & Kakani. (2007). *Financial Accounting for Management*. TMH, 2nd Edition.
- Tulsian. P. C. (2008). *Financial Accounting*. Pearson Education Narayanswami.

#### **Teaching Plan:**

**Week 1:** Unit I: Introduction to financial accounting and financial management, Concept, nature, and scope of financial accounting, Financial accounting – generally accepted accounting principles (GAAP)

**Week 2:** Unit I: Introduction to financial accounting and financial management, Accounting process and system- journal, ledger & trial balance, Cost accounting and Management accounting, Objectives, nature and scope of financial management, Unit II: Financial Statements & tools of financial analysis, Nature, functions & limitations of various financial statements

**Week 3:** Unit II: Financial Statements & tools of financial analysis, Preparations of Profit and Loss accounts and Balance sheets, Long term Assets and Depreciation / Inventory

**Week 4:** Unit II: Financial Statements & tools of financial analysis, Tools of financial analysis: Fund flow analysis, Cash flow analysis, analysis of operating and financial leverages

**Week 5:** Unit II: Financial Statements & tools of financial analysis, Ratio analysis, Cost volume profit (break-even) analysis

**Week 6:** Unit II: Financial Statements & tools of financial analysis, Analysis of operating and financial leverages

**Week 7:** Unit III: Cost accounting, Costing fundamentals: Cost concepts & classifications, Materials, Direct Labor and Direct Expenses, Overheads general, Overheads Distributions

**Week 8:** Unit III: Cost Accounting, Costing for Specific Industries: Single or Output costing, Job, Batch and Contract costing, Process Costing, Operating costing

**Week 9:** Unit III: Cost Accounting, Costing for Control: Budgetary control

**Week 10:** Unit III: Cost Accounting, Standard costing & Variance analysis, Marginal costing & Cost volume profit analysis

**Week 11:** Unit IV: Financial planning, Raising long term funds: Planning capital structure, Internal financing, Issue of bonus shares, Rights Shares, Rights Debentures, Capital Budgeting, Cost of Capital

**Week 12:** Unit IV: Financial planning, Managing short term finance: Management of Working capital, Management of Inventories

**Facilitating the Achievement of Course Learning Outcomes:**

Unit No.	Course Learning Outcomes	Teaching & Learning Activity	Assessment Tasks
1, 2	After the completion of this course the students will have knowledge about principles and techniques of accounting information for decision-making and control	Classroom lectures and Power-point presentations will be the primary teaching mode for understanding basic concepts	Test on understanding of Accounts/financial concepts.
3, 4	Acquire skills in the use of tools, techniques and processes of financial management in the realm of financial decision-making	Classroom lectures and power-point presentations will be use.	Assignment on application of Financial management tools.

## **SEMESTER II**

**CC205: STATISTICS AND COMPUTER APPLICATIONS  
THEORY**

**Marks: 100**

**Duration: 3 Hrs.**

**Course Objectives:**

To understand the basic concepts, theories and methods in statistics, learn basic statistical procedures for research and understand applications of statistical techniques for analysis and interpretation

**Course Learning Outcomes:**

Student will be able to-

1. Differentiate between the qualitative and quantitative methods of analysis of data
2. Suitably apply data reduction strategies and illustrate data using various graphical methods
3. Use appropriate parametric and non parametric statistical tests
4. Draw conclusions and interpretations from the analysis of data using various statistical softwares

**CONTENTS**

**PERIODS**

**UNIT I: Introduction to statistics**

**4**

- Basic principles and concepts in statistics
- Orientation to qualitative and quantitative research procedures
- Measurement and computation- Scales of measurement, Reliability and validity

**UNIT II: Organisation and presentation of data**

**10**

- Qualitative and quantitative data- Coding & data reduction strategies
- Organisation of Data: Frequency distributions vs. thematic analysis
- Percentage, percentile ranking and frequencies
- Univariate, bivariate and multivariate tables
- Graphic representation: Graphs, diagrams and charts

**UNIT III: Descriptive Statistics**

**6**

- Applications of descriptive statistics
- Measures of Central tendency and Variability

**UNIT IV: Probability and normal distribution**

**12**

- Basic principles and applications of probability
- Normal curve
- Characteristics of distributions: Skewness, kurtosis
- Testing hypotheses: Levels of significance and p values
- Errors in hypothesis testing: Type I, Type II
- Sampling distribution
- Standard scores, calculation and application

## UNIT V: Statistical tests

12

- Concept of parametric and non-parametric tests, statistical tests and level of measurement
- Parametric tests of difference: T test, ANOVA and post hoc analysis of significance
- Parametric tests of association: Pearson's product moment r
- Non-parametric tests of difference: Mann-Whitney, Sign, Median, and Kruskal-Wallis
- Non-parametric tests of association: Spearman's r
- Chi-square test
- Regression and its applications
- Tests for ascertaining reliability of instruments

## UNIT VI: Analysis and interpretation

4

- Guidelines for selecting an appropriate test
- Interpreting results- Statistical inference
- Research Conclusion and recommendations

### Suggested Readings:

- Agresti, A. & Franklin C.A. (2009) *Statistics: The Art and Science of Learning from Data* ( Second Edition) Boston,MA: Pearson Prentice Hall, ISBN 978-0-13-513199-2
- Bernard, H.R. (2000). *Social Research Methods: Qualitative and Quantitative Approaches*. Thousand Oaks, CA: Sage.
- Black, J.A. and Champion, D.J. (1976). *Methods and Issues in Social Research*. New York: John Wiley and Sons.
- Blaxter, L., Hughes, C, and Tight, K. (1999). *How to Research*. New Delhi: Viva books.
- Diez, D. M., Barr, C. D., Cetinkaya-Rundel M. (2015). *OpenIntro Statistics*:((Third Edition). CreateSpace Independent Publishing Platform. ISBN-10: 194345003X, ISBN-13: 978-1943450039 <http://www.openintro.org/stat/textbook.php>.
- Elmes, D.G., Kanowitz, B.H. and Roediger, H.L. (1989). *Research Methods in Psychology* (Third Edition). New York: West Publishing Company.
- Fowler, F.J. (1988). *Survey Research Methods. Applied Social Research Methods Series, Vol. I*. Newbury Park, CA: Sage.
- Gordis L. (2013) *Epidemiology*. (Fifth Edition). Philadelphia, PA: Saunders Elsevier,
- Greene, S. and Hogan, D. (Eds.). (2005). *Researching Children's Experiences: Methods and Approaches*. London: Sage.
- Minium, E. W., King, B. M., & Bear, G. (1995/2004). *Statistical Reasoning for Psychology and Education*. New York: Wiley and Sons.
- Muijs, D. (2004). *Doing Quantitative Research in Education with SPSS*. London: Sage.

### Teaching plan:

**Week 1:** Basic principles and concepts in statistics, Orientation to qualitative and quantitative research procedures, Scales of measurement, Reliability and validity

**Week 2:** Qualitative and quantitative data- Coding and data reduction strategies, Organisation of Data: Frequency distributions vs. thematic analysis

**Week 3:** Percentage, percentile ranking and frequencies, Univariate, bivariate and multivariate

tables

**Week 4:** Graphic representation: Graphs, diagrams and charts, Applications of descriptive statistics

**Week 5:** Measures of Central tendency and Variability

**Week 6:** Basic principles and applications of probability, Normal curve

**Week 7:** Characteristics of distributions: Skewness, kurtosis, Testing hypotheses: Levels of significance and p values

**Week 8:** Errors in hypothesis testing: Type I, Type II, sampling distribution standard scores, calculation and application

**Week 9:** Concept of parametric and non-parametric tests, statistical tests and level of Measurement, Parametric tests of difference: T test, ANOVA and post hoc analysis of significance

**Week 10:** Parametric tests of association: Pearson's product moment  $r$ , Non-parametric tests of difference: Mann-Whitney, Sign, Median, and Kruskal-Wallis

**Week 11:** Non-parametric tests of association: Spearman's  $r$ , Chi-square test, Regression and its applications, Tests for ascertaining reliability of instruments

**Week 12:** Guidelines for selecting an appropriate test, Interpreting results- Statistical inference, Research Conclusion and recommendations

**Facilitating the achievement of Course Learning Outcomes:**

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Understand the basic concepts, theories and methods in statistics and Differentiate between the qualitative and quantitative methods of analysis of data	Unit transaction through power point presentations,	Assignments, Open book test
2	Suitably apply data reduction strategies and illustrate data using various graphical methods	Unit transaction through power point presentations and classroom discussion	Quizzes and objective test
3	Learn basic statistical procedures for research	Unit transaction through power point presentations and classroom discussion	Assignments, Open book test
4	Learn basic statistical procedures for research	Unit transaction through power point presentations and classroom discussion	Assignments, Open book test
5	Use appropriate parametric and non-parametric statistical tests	Unit transaction through power point presentations and classroom discussion	Class assignments and quizzes

6	Draw conclusions and interpretations from the analysis of data	Unit transaction through power point presentations and classroom discussion	Assignments, Open book test
---	--	---	-----------------------------

**CC205: STATISTICS AND COMPUTER APPLICATIONS  
PRACTICAL**

**Marks: 50**

**Duration: 3 Hrs.**

**Course Objectives:**

To understand the basic concepts, theories and methods in statistics, learn basic statistical procedures for research and understand applications of statistical techniques for analysis and interpretation

**Course Learning outcomes:**

Student will be able to-

1. Identification of various types of data measurement tools/tests/procedures and understanding the concept of standardisation and reliability and validity.
2. Application of various data reduction and coding methods on quantitative and qualitative data.
3. To be able to organise the data and effectively use appropriate quantitative and qualitative statistical softwares for analysis of data
4. Draw conclusions and interpretations from the analysed data and write reports.

**Teaching plan:**

**Week 1, 2 and 3** - Review of Measurement tools/tests/procedures: Standardisation, Reliability, Validity

**Week 4 and 5** - Data reduction strategies and Coding of quantitative and qualitative data

**Week 6, 7, 8 and 9** - Analysis of data using appropriate statistical software (, Qualitative and quantitative open source software)

**Week 10** - Data Visualization

**Week 11 and 12** - Data Interpretation and report writing

**Facilitating the achievement of Course Learning Outcomes:**

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	<b>Week 1 &amp; 2</b> Identification of various types of data measurement tools/tests/procedures and understanding the concept of standardisation and reliability and validity	Standard tools/test methods and procedures will be reviewed to understand concepts of reliability and validity	Standardised tools will be given to students and activities will be planned to understand the concept of standardisation and determination of reliability and validity

2	<b>Week 3</b> Introduction to computer tools and software in statistical analysis	Open source and other software for quantitative and qualitative data analysis will be reviewed and students will be made familiar about their use	Students gets familiarized with basic functions and tools of any statistical software
3	<b>Week 4 and 5</b> Application of various data reduction and coding methods on quantitative and qualitative data.	Data collected using standard measurement tools will be organised using appropriate data reduction strategies and coded	Data organisation through spread sheets – manually and using computers. Display of data using graphical representation methods.  Data is collected, coded and formulates tables using appropriate software
4	<b>Week 6,7 8 and 9</b>  To be able to organise the data and effectively use appropriate quantitative and qualitative statistical softwares for analysis of data	Data analysis using suitable quantitative and qualitative software	Assignments to be planned using statistical software for  Data entry and its analysis.  Use of statistical test for analysis
5	<b>Week 10, 11 and 12</b>  Draw conclusions and interpretations from the analysed data and write reports	Data interpretation and Report writing	Assignments on interpretation of the analysed data  Statistical conclusion and Research conclusion



**RMDACC206: CONSUMER BEHAVIOUR & MARKETING MANAGEMENT  
THEORY**

**Marks: 100**

**Duration: 3 Hrs.**

**Course Objectives:**

The objective of the course is to impart an understanding of the conceptual framework, scope and importance of marketing management, macro and micro environment of organisations and their role in coping with changing market scenario. Further the course will increase the knowledge base of students regarding- importance and techniques of market research and forecasting, understanding consumer behaviour, dealing with competition in the market and managing marketing communication.

**Course Learning Outcomes:**

After completing this course, students will:

1. Develop an understanding of the importance and scope of marketing
2. Understand the changing macro and micro environment of organizations and importance of market research and forecasting
3. Understand consumer behaviour and importance of creating customer value
4. Develop an understanding of the competitive strategies in marketing
5. Understanding the role of marketing communication and its effectiveness

**CONTENTS**

**PERIODS**

**UNIT I: Understanding Marketing Management**

**8**

- Importance and scope of marketing
- Company orientations towards markets and marketing
- Adapting marketing to new economy
- Marketing Management tasks

**UNIT II: Capturing marketing insights**

**10**

- Gathering information and scanning the environment
- Analyzing the macro environment (demographic, economic, technological, political, legal, social, cultural)
- Conducting market research
- Forecasting and demand measurement
- New product development-challenges and process

**UNIT III: Consumer Behaviour**

**10**

- Understanding consumer behavior, Factors influencing consumer behaviour
- Consumer Adoption Process-stages and factors influencing
- Buying decision process- five stage model
- Creating customer value, satisfaction and loyalty
- Cultivating customer relationships
- Segmenting consumer markets, market targeting

#### **UNIT IV: Dealing with Competition**

**10**

- Identify and analyse competitors , competitive strategies for marketing
- Building strong brands- creating brand equity, brand positioning, differentiation strategies
- Product life-cycle marketing strategies
- Shaping market offerings, developing brand strategies, meeting customer satisfaction
- Product classifications, product and brand relationship
- Characteristics of services, marketing strategies for service firms, Managing service quality, differentiating services

#### **UNIT V: Marketing communication**

**10**

- Role of marketing communication, designing effective marketing communication
- Deciding on the marketing communication mix
- Managing mass communication: Advertising, sales promotions and public relations
- Developing and managing advertising programmes
- Deciding on media and measuring effectiveness
- Managing Personal Communication: direct marketing and personal selling

#### **Suggested Readings:**

- Kotler P, Keller K.L., Koshy A, Jha M. (2006). *Marketing Management A South Asian, Perspective*, Pearson Education.
- Kotler, P. (2004). *Marketing Management 11th ed.* Pearson Education.
- Kotler, P. (2004). *Principles of Marketing. 11th ed.* Pearson Education.
- Michael, J. E., Bruce, J. W. and Williom, J. S. (13th Edition, 2004). *Marketing Management.* Tata McGrawHill, New Delhi.
- Schiffman, L. G., Kanuk, L. L. & Kumar, S. R. *Consumer Behavior.* 10th edition, Pearson Publications
- Schiffman, LG. and Kanuk, L.L, (1994). *Consumer Behavior.* New Delhi: Prentice Hall

#### **Teaching Plan:**

**Week 1:** Importance and scope of marketing, Company orientations towards marketplace, Adapting marketing to new economy

**Week 2:** Marketing Management tasks, Gathering information and scanning the environment

**Week 3:** Analyzing the macro environment (demographic, economic, technological, political, legal, social, cultural), Conducting market research

**Week 4:** Forecasting and demand measurement, New product development-challenges and process, Understanding consumer behavior, Factors influencing consumer behaviour

**Week 5:** Consumer Adoption Process-stages and factors influencing, Buying decision process-five stage model, Creating customer value, satisfaction and loyalty, Cultivating customer relationships

**Week 6:** Segmenting consumer markets, market targeting, Identify and analyse competitors

**Week 7:** Competitive strategies for marketing, Building strong brands- creating brand equity, brand positioning, differentiation strategies

**Week 8:** Product life-cycle marketing strategies, Shaping market offerings, Developing brand strategies, meeting customer satisfaction

**Week 9:** Product classifications, product and brand relationship, Characteristics of services, marketing strategies for service firms, Managing service quality, differentiating services

**Week 10:** Role of marketing communication, Designing effective communications, Deciding on the Marketing communication mix

**Week 11:** Managing mass communications: Advertising, sales promotions and public relations, Developing and managing advertising programmes

**Week 12:** Deciding on media and measuring effectiveness, Managing Personal Communications: direct marketing and personal selling, Revision

**Facilitating the achievement of Course Learning Outcomes:**

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Develop an understanding of the importance and scope of marketing	Unit transaction through power point presentations	Assignments, Open book test
2	Understand the changing macro and micro environment of organizations and importance of market research and forecasting	Unit transaction through power point presentations and classroom discussion	Quizzes and objective test
3	Understand consumer behaviour and importance of creating customer value	Unit transaction through power point presentations and classroom discussion	Assignments, Open book test
4	Develop an understanding of the competitive strategies in marketing	Unit transaction through power point presentations and classroom discussion	Assignments, Open book test
5	Understanding the role of marketing communication and its effectiveness	Unit transaction through power point presentations and classroom discussion	Class assignments and quizzes

**RMDACC206: CONSUMER BEHAVIOUR & MARKETING MANAGEMENT  
PRACTICAL**

**Marks: 50**

**Duration: 3 Hrs.**

**Course Objectives:**

The objective of the course is to impart an understanding of the practical aspects of marketing management including designing market research strategy and tools, analysis of brand building tools used by industry, case studies of competitive strategies used in marketing and assessment

of online marketing website and consumer experiences.

**Course Learning Outcomes:**

After completing this course, students will be able to:

1. Design and develop market research proposals for specific industry needs- assessing the market for new product launch, product feedback, comparative assessment, and so on
2. Learn through Case study approach the marketing strategies used by large, medium and small companies with emphasis on marketing mix used, marketing budgets, media use, creating customer value and cultivating customer relationships
3. Critically analyze and compare marketing strategies of competing brands, tools used by them for brand building and generating brand equity and suggest suitable strategies to be followed by market followers to become leaders
4. Understand the key features of online retailing websites and their features, customer experience and satisfaction

**CONTENTS**

**PERIODS**

**UNIT I: Market research proposals**

**15**

Developing market research proposals on consumer buying behaviour, effect of promotional schemes on consumer purchase, consumer satisfaction and opinion regarding selected products/brands/marketing strategies, online purchasing etc.

**UNIT II: Case studies**

**8**

Using Case study approach (using both secondary and primary data) to develop an understanding of marketing strategies used by large, medium and small companies with emphasis on marketing strategies, marketing mix used, marketing budgets, media use, creating customer value and cultivating customer relationships

**UNIT III: Brand comparison**

**15**

Brand comparisons of products and services in terms of their marketing strategies, tools used by them for brand building and generating brand, find out their strengths and weaknesses and suggest suitable marketing strategies to increase their market share.

**UNIT IV: E-commerce**

**10**

E-commerce – Assessment and critical analysis of online retailing websites with focus on visibility, user interface, experience, ease of transaction etc. Further, to develop an e-tailing prototype.

**Suggested Readings:**

- Baines, Fill, Sinha & Page. (2013). *Marketing*. Oxford University Press, New Delhi, Asian Edition, ISBN: 0-19-807944-3
- Kotler, P. (2003). *Marketing Insights from A to Z: 80 Concepts Every Manager Needs to Know*.
- Kotler, P., Armstrong, G., Agnihotri, P. Y., & Haque, E. U. (2011). *Principles of Marketing*. Pearson, New Delhi, 13th edition, ISBN:978-81-317-3101-7

- Kotler, P., Keller, K. (2016). *Marketing Management*, Pearson, New Delhi, 15th edition ISBN:978-81-317-3101-7
- Kotler, P., Keller, K. L., Koshy, A., & Jha, M. (2013). *Marketing Management, 14th Edition*. Pearson Education

**RMDACC207: SUSTAINABILITY REPORTING & CORPORATE SOCIAL  
RESPONSIBILITY  
THEORY**

**Marks: 100**

**Duration: 3 Hrs.**

**Course Objectives:**

The course aims to create an understanding about the need and benefits of sustainability reporting for businesses, measuring and monitoring sustainability performance, and details of sustainability standards, indices and guidelines. Further it will equip students with approaches, policy perspective and practices for CSR. Industry norms, potential business benefits, stakeholder influence with regard to CSR will be an important aspect of the course.

**Course Learning Outcomes:**

After completing this course, students will:

1. Understand the history, need and benefits of sustainability reporting for businesses
2. Know how to monitor and measure sustainability performance
3. Know about sustainability standards, indices and reporting guidelines
4. Develop an understanding of the scope, approaches, policy and procedure of Corporate Social Responsibility (CSR)

**CONTENTS**

**PERIODS**

**UNIT I: Introduction to sustainable reporting 10**

- Sustainability and business, triple bottom line approach to business
- Financial and non-financial disclosures, need and benefits of sustainability reporting
- Tools for stakeholder communication and sustainability performance

**UNIT II: Monitoring and measuring sustainability performance 10**

- Define sustainability, policy and procedures of sustainability management
- Measuring, monitoring and improving performance
- Establishing indicators

**UNIT III: Sustainability standards, indices and reporting 10**

- GRI framework-disclosure, regulation, performance indicators; UN Global compact; CDP; OECD guidelines for multinational corporations etc.
- Prerequisites for sustainability report- structure, stakeholder engagement, indicator development, materiality assessment information; writing the report, verification and assurance of the report

#### **UNIT IV: Sustainability reporting in India**

**8**

- Current and future trends, role of regulators, institutional framework, stakeholder engagement
- Sustainability reporting guidelines for PSUs, national voluntary guidelines, sustainability reporting by corporate sector

#### **UNIT V: CSR in India**

**10**

- Introduction, definition, approaches, importance, scope, history, concept and consumer perspective to CSR
- Policy, practices and Initiatives for CSR, legal and economic perspective, theories, Industry Norms
- Potential Business benefits, Criticism and concerns, Stakeholder Influence
- Global and Indian Scenario with Case studies

#### **Suggested Readings:**

- Ahluwalia, J. S. (2015). *Environmental Governance for Sustainability* in Ahluwalia, J. S. (Editor), *Environmental Governance: Transition to a Green Economy*, New Delhi, IOD Publishing
- C.V. Baxi and Roopmanjari Sinha Roy. *Corporate Social Responsibility*, 2011, Vikas Publishing House, New Delhi.
- James, Paul with Magee, Liam, Scerri, Andy, and Steger, Manfred B. (2015) *Urban Sustainability in Theory and Practice: Circles of Sustainability*, London, Routledge
- Nielsen (2015), *The Nielsen Global Survey of Corporate Social Responsibility and Sustainability*, Oxford, Nielsen
- Rogers, Jalal & Boyd: *An Introduction to Sustainable Development*, PHI Learning, 2007
- Singh, *Triple Bottom Line Reporting and Corporate Sustainability*, PHI learning, 2006.

#### **Teaching Plan:**

**Week 1:** Sustainability and business, triple bottom line approach to business, Financial and non-financial disclosures, need and benefits of sustainability reporting

**Week 2:** Tools for stakeholder communication and sustainability performance

**Week 3:** Define sustainability, policy and procedures of sustainability management

**Week 4:** Measuring, monitoring and improving performance, Establishing indicators

**Week 5:** GRI framework-disclosure, regulation, performance indicators; UN Global compact; CDP; OECD guidelines for multinational corporations etc.

**Week 6:** Prerequisites for sustainability report- structure, stakeholder engagement, indicator development, materiality assessment information; writing the report, verification and assurance of the report

**Week 7:** Current and future trends, role of regulators, institutional framework, stakeholder engagement

**Week 8:** Sustainability reporting guidelines for PSUs, national voluntary guidelines, sustainability reporting by corporate sector

**Week 9:** CSR in India: Introduction, definition, approaches, importance, scope, history, concept and consumer perspective to CSR

**Week 10:** Policy, practices and Initiatives for CSR, legal and economic perspective, theories, Industry Norms

**Week 11:** Potential Business benefits, Criticism and concerns, Stakeholder Influence

**Week 12:** Global and Indian Scenario with Case studies, Revision and clarification of doubts

**Facilitating the achievement of Course Learning Outcomes:**

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Understand the history, need and benefits of sustainability reporting for businesses	Unit transaction through power point presentations and classroom discussion	Assignments, Open book test
2	Know how to monitor and measure sustainability performance	Unit transaction through power point presentations, classroom discussion, case studies	Quizzes and objective test
3	Know about sustainability standards, indices and reporting guidelines	Unit transaction through power point presentations and classroom discussion	Assignments, Open book test
4, 5	Develop an understanding of the scope, approaches, policy and procedure of Corporate Social Responsibility (CSR)	Unit transaction through power point presentations, classroom discussion, case studies	Quizzes and objective test

**RMDACC208: FACILITIES AND SERVICES MANAGEMENT  
THEORY**

**Marks: 100**

**Duration: 3 Hrs.**

**Course Objectives:**

This course focuses on providing understanding of the concept and need for management of services and facilities to maintain the work areas and maintain efficiency in core areas of work of an organization. It covers the operations and maintenance of facilities with respect to soft and engineering services.

**Course Learning Outcomes:**

After completing this course, students will be able to:

1. Comprehend various aspects of facilities maintenance and services, materials and accessories in indoor and outdoor environment.
2. Understand the systems-operations management, quality control and project review techniques.

3. Develop competence among students for professional practice in management of facilities

## **CONTENTS**

## **PERIODS**

### **UNIT I: Basics of Services and Facilities Maintenance**

**12**

- Concept & need for management of facilities and services
  - Preventive maintenance& predictive maintenance
  - Statutory compliances: Licenses
- Role of a facility manager
- Modern cleaning materials, techniques and equipment
- Maintenance of interior & exterior surfaces including critical area identification for:
  - Walls and ceilings; Doors, windows, cupboards and cabinets; Floor covering and floorings; Furniture; Accessories; Furnishings: upholstery, curtains and draperies, blinds; Kitchen work areas; Laundry; Washrooms; Maintenance of common / public spaces

### **UNIT II: Operation & Maintenance of Facilities & Services**

**15**

- Process of operations, in-sourcing & outsourcing O&M
- Soft services
  - Coordination of housekeeping services: maintenance and upkeep
  - Help desk and knowledge base
  - Visitor management system
  - Asset management
  - Work order management, time and attendance system
  - Inventory management
  - Work flow management
  - Property management, space helpdesk, energy dashboard, BAS (building automation system) / BMS (building management system) integration, mail room services, project management,
  - Vendor procurement management, facility management system
  - SLA (service level agreement) management
  - Tenant billing system
- Engineering Services: Efficient operation and maintenance
  - Electrical –LT panel, Lighting fixtures, energy conservation in lighting
  - HVAC: air-conditioning&heating system, electric consumption and efficiency, air quality with respect to occupancy ratio
  - Plumbing system: quality of potable water, water treatment plant (RO), water supply system - hydro-pneumatic, pumps for bore-wells, sump-pits, water analysis
  - Waste disposal methods and techniques – sewage treatment plant (STP), Affluent treatment plant (ATP), solid waste management
  - Safety & security services: fire prevention & control system (wet and dry), CCTV cameras, automated control monitoring systems

### **UNIT III: Techniques for Management of Facilities and Services**

**12**

- Information systems



- Data management and monitoring
- Software/technologies for maintenance of interiors
- Project management and review techniques
- Professional practice in facilities management
  - Taking orders, understanding needs and details
  - Creating maintenance plans, budgets and costing / proposals & tenders
  - Implementation and monitoring the plan of work
- Quality specifications
  - ISO specifications
  - SIPOC tool for design and review of a process
- Futuristic facility management

#### **Unit IV: Maintenance of indoor and outdoor plants**

**9**

- Selection of indoor and outdoor ornamental plants
- Landscaping components, styles of gardens
- Maintaining gardens: care of plants

#### **Suggested Readings:**

- Brooker, G. (2017). The interiorscape: Amalgams and composites. *Palgrave Communications*, 3, 1705.
- Construction Products in India. (2007). *The issues, the potential and the way ahead*, CCPS (Confederation of Construction and Services): New Delhi.
- Editors of Consumer Guide. (1980). *Plumbing Repairs Made Easy*. Illinois: International Publications Ltd.
- *Facilities Engineering Journal*, Orangetap & Association for Facilities Engineering's (AFE)
- *Facilities Manager Magazine*, Published by APPA
- *International Journal of Facility Management*, Elsevier
- *ISO/TC 267. (2018). Facility management, International Standards Organization*
- *Journal of Facilities Management*, ISSN: 1472-5967, Emerald Insight
- *Journal of Facility Management*, ISSN: 1472-5967, Online from: 2002, Emerald Publishing House
- Manchanda et, al. (1999). *Household Materials –A Manual for Care and Maintenance*, Phoenix Publishing House: New Delhi.
- Wiggins, JaneM. (2010). *Facilities Manager's desk reference*, ISBN: 978-1-1444-32047-3, Wiley-Blackwell

#### **Teaching Plan:**

**Week 1:** Unit I - Concept & need for management of facilities and services, Modern cleaning materials, techniques and equipment

**Week 2:** Unit I - Application and Maintenance of interior & exterior surfaces including critical area identification for: Walls and ceilings, Doors, windows, cupboards and cabinets, Floor covering and floorings, Furniture, Accessories, Furnishings: upholstery, curtains and draperies, blinds, Kitchen work areas, Laundry, Washrooms, Maintenance of common / public spaces

**Week 3:** Unit I - Preventive maintenance & predictive maintenance, Statutory compliances: licenses

**Week 4:** Unit II - Process of operations, Coordination of housekeeping services: maintenance and upkeep, Electrical –LT panel, Lighting fixtures, energy conservation in lighting, efficient O & M of electrical equipment

**Week 5:** Unit II - HVAC: efficient O & M of air-conditioning & heating system, electric consumption and efficiency, air quality with respect to occupancy ratio, O & M of Plumbing system: quality of potable water, water treatment plant (RO), water supply system - hydro-pneumatic, pumps for bore-wells, sump-pits, water analysis

**Week 6:** Unit II - O & M of waste disposal methods and techniques – sewage treatment plant (STP), Affluent treatment plant (ATP), solid waste management, O & M of safety & security services: fire prevention & control system (wet and dry), CCTV cameras, automated control monitoring systems

**Week 7:** Unit III - Information systems: Data management and monitoring, Software/technologies for maintenance of interiors, Project management and review techniques, Professional practice in facilities management: Taking orders, understanding needs and details

**Week 8:** Unit III - Professional practice in facilities management (cont.): Creating maintenance plans, budgets and costing / proposals & tenders, Implementation and monitoring the plan of work, Quality specifications: ISO specifications, SIPOC tool for design and review of a process

**Week 9:** Unit IV - Understanding Interiorscaping, Selection of indoor and outdoor ornamental plants

**Week 10:** Unit IV - Landscaping components, styles of gardens

**Week 11:** Maintaining gardens: care of plants

**Week 12:** Revision

**Facilitating the achievement of Course Learning Outcomes:**

Unit No.	Course Learning Outcomes	Teaching & Learning Activity	Assessment Tasks
1	<ul style="list-style-type: none"> <li>Gaining knowledge about the concept of faculties – Application, management and its importance</li> <li>Understanding application and maintenance of Interior &amp; Exterior Services</li> <li>Developing an understanding of the concept of preventive maintenance and predictive maintenance</li> </ul>	<p>Classroom teaching including lecture method and power-point presentation.</p> <p>Introduction to various materials and their properties first hand.</p> <p>Field visits to organizations</p>	<p>Term test</p> <p>Case study of two organizations with examples of successful and unsuccessful management of facilities (based on secondary research)</p> <p>Term paper on materials used for surfaces and cleaning methods and techniques</p>
2	<ul style="list-style-type: none"> <li>Understanding the process of operations and</li> </ul>	<p>Classroom teaching including lecture method,</p>	<p>Case profile of O &amp; M of one organization (primary</p>

	maintenance of facilities	group discussion and power-point presentation.  Visit to various facilities to observe their Operations and Maintenance.	research) to study their facilities.  Preparation of a Facilities maintenance plan keeping in mind all the variables.
3	<ul style="list-style-type: none"> <li>• Gaining knowledge about the information systems (data management and technologies)</li> <li>• Acquiring professional creating maintenance plans, taking orders, budgeting and monitoring of the whole system.</li> <li>• Gaining knowledge of ISO specification and SIPOC Tool.</li> </ul>	<p>Classroom teaching including lecture method and power-point presentation.</p> <p>Secondary research using books and internet will be used to supplement classroom learning.</p> <p>Classroom teaching</p> <p>Making a plan using SIPOC tool</p>	<p>Term Test</p> <p>Visit to organization to understand their operation and maintenance of facilities</p> <p>SIPOC tool assessment</p>
4	<ul style="list-style-type: none"> <li>• Understanding plant terminology</li> <li>• Cultivation and maintenance of both indoor and outdoor plants</li> <li>• Developing an understanding about various landscaping components and styles of gardens</li> </ul>	<p>Classroom teaching including lecture method and power-point presentation.</p> <p>Field visits and primary research / observation to supplement classroom teaching</p>	<p>Field survey to identify different types of gardens and landscaping components.</p> <p>Portfolio on plant (Indigenous, hybrid, genetically modified, indoor, etc) varieties.</p>

**RMDACC209: FACILITIES AND SERVICES MANAGEMENT, ECONOMIC EMPOWERMENT OF COMMUNITIES INTEGRATED PRACTICAL**

**Marks: 100**

**Duration: 6 Hrs.**

**Course Objectives:**

The practical will assist in developing knowledge about composition, properties and finishes of various materials used in daily life and their care and maintenance. It will concentrate on preparing maintenance plans for a facility with emphasis on HVAC, indoor comfort and human health.

The purpose of the course is to explore community development approaches to local economic development. In this course, students explore marginalized communities. Students investigate

community growth and program planning in order to develop marginalized community-based programs.

**Course Learning Outcomes:**

After completing this course, students will be able to:

1. Assess requirements, methods and techniques for maintenance of different facilities & services.
2. Able to execute professional projects for management of facilities & services including operations management, quality control and project review techniques.
3. Understand opportunities for marginalized community growth
4. Analyze marginalized community needs
5. Identify the elements of project in creating community change
6. Develop community program for Economic Empowerment

**CONTENTS**

**PERIODS**

**UNIT I: FACILITIES AND SERVICES MANAGEMENT**

- **Assessing scope of work for maintenance & management of facilities & services** **8**
  - Survey of different finishes on surfaces of walls, ceilings and floors, doors and windows, furniture, furnishings and accessories. Analyze methods and mechanisms for cleaning and maintenance of facilities
  - Case Studies for critical evaluation of maintenance of individual and public areas with respect to services and facilities such as residences (rural and urban); institutional / Government / NGO / Corporate; hotels and restaurants; hospitals; gymnasiums, health clubs and sports complexes; exhibitions and conferences
- **Maintenance Plans** **24**
  - Lighting design, energy audit of lighting design
  - Maintenance plans for specific facility
  - Preparing detailed plans for-
    - a. Operations and maintenance of soft services & engineering services
    - b. Maintenance of facilities and services using project review techniques such as SIPOC
- **Maintenance of plants** **6**
  - Maintenance of indoor and outdoor plants: cutting, budding, layering, grafting
  - Creating miniature gardens for indoor and outdoor surroundings
- **Professional Practice** **10**
  - Detailed plan for maintenance of facilities management with respect to -
    - a. Taking orders, detailed checklist of requirements
    - b. Creating maintenance plan, budget proposals & tenders
    - c. Implementation and monitoring plan of work

**UNIT II: ECONOMIC EMPOWERMENT OF COMMUNITIES**

- **Community and community networks** **10**
  - Detailed demographic and socio-economic profile of a community
  - Need assessment and analysis through case studies of selected communities: Operations, networks, skill auditing, challenges
- **Stakeholders' perspective** **8**

- Analysis of stakeholders- business/owners, employers, aggregators, NGOs etc. on economic challenges, opportunities, and visions for their communities
- **Program planning** **12**
  - Program conceptualization and planning for economic empowerment of communities
  - Program implementation and evaluation
- **Sustainability Reporting and CSR** **18**
  - Evaluation of CSR reports through case studies
  - Structure, stakeholder engagement, indicator development, materiality assessment information; writing the report, verification and assurance of the report
  - Visits to organizations and communities

### **Suggested Readings:**

- Fediw, K. (2015). *The manual of interior plantscaping: A guide to design, installation, and maintenance*. Portland, OR: Timber Press.
- Garcia-Diaz, A. & Smith, J. M. (2008). *Facilities planning and design*. Upper Saddle River, NJ: Pearson Prentice Hall.
- Government of India, Economic Survey (latest)
- Government of India, Finance Commission Report (latest)
- Government of India, Five Year Plan (latest)
- ISO/TC 267. (2018). Facility management, International Standards Organization
- Journal of *Facilities Management*, ISSN: 1472-5967, Emerald Insight
- Kapila, U. (2009). *Indian Economy since Independence* (19<sup>th</sup> Ed.). Academic Foundation.
- Kemp, R.; Zuijderwijk, L.; Weaver, P.; Seyfang, G.; Avelino, F.; Strasser, T.; Becerra, L.; Backhaus, J. & Ruijsink, S. (2015). *Doing things differently: Exploring transformative social innovation and its practical challenges* (TRANSIT Brief ; 1)
- Kretzmann, J.P., & McKnight, J.L. (1993). *Building communities from inside out: A path toward finding and mobilising community assets*. ACTA Publications.
- Magee, G. H. (1998). *Facilities maintenance management*. Kingston, MA: R.S. Means
- Mazumdar, D. & Sarkar, S. (2009). *The employment problem in India and the phenomenon of the missing middle*. *Indian Journal of Labour Economics*.
- Ministry of Information and Broadcasting e-book on Major Initiatives.
- Rhonda, P. & Pittman, R.H. (2009). A framework for community and economic development. In Rhonda, P. & Pittman, R.H (Eds.), *An introduction to community development*. New York: Routledge.
- Schaffer, R., Deller, C.S., & Marcouiller, W. D. (2004). *Community economics: Linking theory and practice*. Blackwell Publishing.
- Singer, H. (1970). Dualism Revisited: A New Approach to the Problems of Dual Society in Developing Countries. *Journal of Development Studies* 1, pp. 60-1.
- Temali, M. (2002). *The community economic development handbook: Strategies and tools to revitalize your neighborhood*. Amherst H. Wilder Foundation.
- Wiggins, J. M. (2010). *Facilities Manager's desk reference*, ISBN: 978-1-1444-32047-3, Wiley-Blackwell

## **SEMESTER III**

## RMDACC310: ENTERPRISE DESIGN & MANAGEMENT

### THEORY

**Marks: 100**

**Duration: 3 Hrs.**

#### **Course Objectives:**

This course is designed with a specific purpose: to nurture innovative and entrepreneurial mind-set. The course imparts essential knowledge and skills on how to start one's own business venture and the various facets that influence successful set up and operations.

#### **Course Learning Outcomes:**

After completing this course, students will:

1. Scan innovative and high-potential commercial opportunities
2. Drive innovation and business development
3. Understand the dynamics of enterprise management

### CONTENTS

### PERIODS

#### **UNIT I: Innovation and Entrepreneurship**

**8**

- Understanding, exploring, and applying innovation-related concepts
- Principles and practices involved with new venture creation

#### **UNIT II: Emerging Trends, Technology, and Innovation**

**10**

- Emerging trends and disruptors in technology and industry that create new markets and influence decision making
- Product development, business models, and business practices associated with innovation

#### **UNIT III: Business Modeling and New Venture Creation**

**12**

- Identifying a problem or market opportunity
- Process of launching a new venture, in a corporate setting or as a new start-up
- Developing business models, forming a team, analyzing markets, assessing the competitive environment, and planning to acquire leadership talent
- Pitfalls and Plan Execution

#### **UNIT IV: Financing Sources Panel & Financial Projections**

**12**

- Bootstrapping the early stages
- Funding from the 3 F's
- Angels
- Private placements
- Customer financing
- Consulting
- Venture capital
- Bank financing
- Financial projection techniques

## UNIT V: Legal Issues

6

- Intellectual Property Law-Patents
- Copyrights
- Trademarks and Trade secrets
- Major hidden tax traps in starting a business

### Suggested Readings:

- Charantimath, P. *Entrepreneurship development- Small Business Enterprise*. Pearson Education
- Chhabra, T.N. *Entrepreneurship Development*. Sun India Publications, New Delhi
- Khanna, T. (2008). *Billions of entrepreneurs: How China and India are reshaping their futures and yours*. Harvard Business School Press.
- Mullins, J. W., & Komisar, R. (2009). *Getting to plan B breaking through to a better business model*. Boston: Harvard Business Press.
- Roy, R. (2008). *Entrepreneurship*. New Delhi: Oxford University Press.
- Stevenson, H. H., Roberts, M. J., Bhide, A., Shalman, W. A. (Eds.). (2008). *The Entrepreneurial venture. (The Practice of Management Series)*. New Jersey: Harvard Business Press

### Teaching Plan:

**Week 1:** Understanding, exploring, and applying innovation-related concepts

**Week 2:** Principles, and practices to corporate environments involved with new venture creation and other contexts

**Week 3:** Emerging trends and disruptors in technology and industry that create new markets and influence decision making

**Week 4:** Product development, business models, and business practices associated with innovation

**Week 5:** Identifying a problem or market opportunity

**Week 6:** Process of launching a new venture, in a corporate setting or as a new start-up

**Week 7:** Developing business models, forming a team, analyzing markets, assessing the competitive environment, and planning to acquire leadership talent, Pitfalls and Plan Execution

**Week 8:** Financing Sources Panel & Financial Projections

**Week 9:** Intellectual Property Law-Patents, Copyrights

**Week 10:** Trademarks and Trade secrets

**Week 11:** Major hidden tax traps in starting a business

**Week 12:** Revision and clarification of doubts

### Facilitating the achievement of Course Learning Outcomes:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Scan innovative and high-potential commercial opportunities	Unit transaction through power point presentations	Assignments, Open book test



2	Drive innovation and business development	Unit transaction through power point presentations and classroom discussion	Quizzes and objective test
3, 4, 5	Understand the dynamics of enterprise management	Unit transaction through power point presentations and classroom discussion, business plan development	Assignments, Open book test

### **RMDACC311: VISUAL MERCHANDISING AND DISPLAY THEORY**

**Marks: 100**

**Duration: 3 Hrs.**

**Course Objectives:**

The course will provide an integrated educational framework within which students are able to acquire knowledge and a range of transferable skills as visual merchandisers and display designers in the contemporary retail environment. It will also provide knowledge and analytical skills in the creation of showroom or retail store window/interior displays that sell merchandise.

**Course Learning Outcomes:**

After completing this course, students will be able to:

1. Apprehend the key terms and principles involved in the components of Visual Merchandising.
2. Understand the importance of visual merchandising and attractive visual display in communicating with customers.
3. Gain proficiency in a comprehensive range of professional skills for relevant display practices in supporting retail environment.

**CONTENTS**

**PERIODS**

**UNIT 1: Introduction to Visual Merchandising and window display 20**

- Understanding the importance and theory of Interior Visual Merchandising
- Exploring and understanding company's visual design policy
- Up selling via window display
- Understanding the different components that contribute to creating high quality window displays
- Factors to be considered when creating a professional window display
- Case study of a retail outlet to understand window display strategies

**UNIT 2: Design Display types and Materials 20**

- Concept, Purpose, style and importance of displays
- Types of window displays
- Materials used in props, signage for use in displays and exhibits.
- Use of Latest Technologies: Augmented and Virtual reality tools, Robotics.

- Understanding of some useful display fixtures, shelves, gondolas, round racks etc.
- Identify the types of Store Exteriors and Interior Display Components
- Visit to a retail store to study the store layout, design, displays, signage, props used, colour, theme and sensory elements.

### **UNIT 3: Professional Practice in Display Design**

**8**

- Assembling and dismantling displays
- Use of safety tools and equipment and procedures for execution of visual display.
- Discussion on safety requirements while changing displays
- Visit to a retail store and observe work related injuries while moving goods.

#### **Suggested Readings:**

- Bergstrom, B. (2009). Essentials of Visual Communication, Laurence King Publishing, London
- Essentials of Visual Communication, Laurence King Publishing, London
- Khaus, K. (2006). Semantic turn a new foundation for design, CRC press
- Landa, Robin. (2010), Advertising by design: Generating and Designing Creative Ideas Across Media, Second Edition, James Wiley
- Linton, H. (1999). Color in Architecture: Design Methods for Buildings, Interiors and Urban Spaces, McGraw-Hill
- Poore. J. (1994). Interior Colour by Design, Rockport Publishers.
- Wiley, J. , (2010), Interior lighting for designers, John Wiley & Sons
- Williams, R. (2007), Visual Communication: Integrating Media, Art, and Science, Routledge Communication Series

#### **Teaching Plan:**

**Week 1:** Understanding the importance and theory of Interior Visual Merchandising

**Week 2:** Role of a Visual Merchandiser and Up selling via window display

**Week 3:** Understanding the different components that contribute to creating high quality window displays

**Week 4:** Factors to be considered when creating a professional window display

**Week 5:** Case study of a retail outlet to understand window display strategies

**Week 6:** Concept, Purpose, style and importance of displays

**Week 7:** Types of window displays and materials used in props, signage .

**Week 8:** Use of Latest Technologies: Augmented and virtual reality tools, Robotics, display fixtures, shelves, gondolas, round racks etc.

**Week 9:** Identify the types of store exteriors and interior display components

**Week 10:** Visit to a retail store

**Week 11:** Assembling and dismantling displays

**Week 12:** Use of safety tools and equipment and procedures for execution of visual display

### Facilitating Achievement of Course Learning Outcomes:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Introduction to Visual Merchandising and window display	Self-directed: Read journal articles, books to collate information on usage of sustainable space Classroom lectures	Comment on a selected article's Group power point presentations on case study.
2	Design Display types and Materials	Classroom lectures site visit	Prepare a list of materials and signages used
3	Professional Practice in Display Design	Classroom lecture, Site visits	Illustrate different safety procedures while assembling and dismantling displays

### RMDACC312: ENTERPRISE DESIGN & MANAGEMENT, VISUAL MERCHANDISING AND DISPLAY INTEGRATED PRACTICAL

**Marks: 100**

**Duration: 6 Hrs.**

#### Course Objectives:

This practical is designed to deepen the student's ability to use innovation to design and develop a viable business proposition. It will also provide drawing and analytical skills in the designing of window/interior displays to support visual merchandising.

#### Course Learning Outcomes:

After completing this course, students will be able to:

- Develop a viable business plan
- Create product prototype or service ideas in a start-up context or within an existing organization
- Apply skills to a team project to commercialize an idea, product, technology, or business
- Gain skills in visualizing and drawing various theme based attractive visual displays.
- Create original concepts through texts, images, layout, graphics and colours for products and their display
- Acquire proficiency in display designing projects manually as well as on computer aided software.

#### CONTENTS

#### PERIODS

#### UNIT I: ENTERPRISE DESIGN AND MANAGEMENT

48

- Case studies on organizations fostering creativity, innovation, and new venture creation.
- Surveys on emerging trends and disruptors in technology and industry that create new markets and influence decision making.
- Developing networking and negotiation skills.

- Business Opportunity Sensing and developing Business Plans with reference to emerging industry trends.
- Plan appraisal and Resourcing.
- Field visits.

## **UNIT II: VISUAL MERCHANDISING AND DISPLAY**

- **Design Exploration** **10**
  - Exploring different themes as per culture, occasion and brand
  - Creating Theme based mood boards for promotional displays.
  - Material exploration and properties
  - Market survey of materials used in display accessories, props, signage, backdrop, banners, planters etc.
- **Planning for Display Areas** **26**
  - Measuring of display areas and understanding different styling techniques, themes
  - Symmetrical and asymmetrical accessories used in display
  - Understanding effects using Lighting scheme, Mannequin grouping, Colour, focal points
  - Assessment and evaluation of display areas, Budget
  - Select a product or line of products and create a point-of-sale display
- **Designing for Visual Displays** **12**
  - Creating detailed plans using AutoCAD 2D and Photoshop – 2D and 3D displays
  - Developing signage's and graphics for specific areas
  - Designing Lighting plans for creating focal points
  - Understanding Practical aspects and limitations of a planned window; and creating window displays models
  - Selecting coverings, props and merchandise

### **Suggested readings:**

- Bhide, A. (2008). *The venturesome economy: How innovation sustains in a more connected world*. New Jersey: Princeton University press.
- Kuratko, D. F., & Hodgetts, R. M. (2007). *Entrepreneurship (7th ed.)*. USA: Thompson-South Western.
- Kuratko, D. F., & Hodgetts, R. M. (2007). *Entrepreneurship: Theory, process, practice*. USA: South Western/ Thomson Learning.
- Mullins, J. W. (2006). *The new business road test: What entrepreneurs and executives should do before writing a business plan (2nd ed.)*. Harlow: Prentice Hall Financial Times.
- Shaoqiang. W. (2018). *Display Art: Visual Merchandising and Window Display*, Flamant publishers
- Stevenson, H. (2007). *Perspective on entrepreneurship*. Boston: Harvard Business Press.
- Wiley. J. (2010). *Interior lighting for designers*, John Wiley & Sons
- Williams. R. (2007). *Visual Communication: Integrating Media, Art, and Science*, Routledge Communication Series

**RMDACC313: INTERNSHIP**  
**(To be assessed by a Board of Three teachers)**

**Marks: 50**

**Course Objectives:**

To gain hands-on experience of working in various settings linked with issues in Resource Management and Design Application.

**Course Learning outcomes:**

Student will be able to -

1. Get hands on experience of real field setting.
2. Develop an understanding of the importance and scope of industry interface
3. Understand the changing micro and macro environment of organizations and importance of industry research and forecasting
4. Develop an understanding of the competitive strategies for industry
5. Establish a link between academic programme and industry as a strategic tool for staying ahead in a competitive market

**Description:**

The student will be required to undergo a field placement for a total duration of 4-6 weeks in their chosen area of interest after the Semester II and prior to Semester III. Depending on the interest of the students the setting may be corporates, design houses, NGOs, environment management organizations, Govt. agencies, green building consultancy firms, market research firms, International agencies, architect firms, research institutes, urban space planning organization, product developers, national and international social development organizations. They must present a report of the placement in their department. Institutions/organizations chosen should be of good professional standing. The student must participate in the on-going activities of the agency/ establishment, acquire skills and knowledge, gather information and prepare a report to be presented in the department after the completion of the placement period.

**RMDACC314: DISSERTATION- I: TECHNICAL WRITING & SEMINAR**

**(Seminar to be assessed by three teachers)**

**(Technical writing to be assessed by Continuous Evaluation)**

**Marks: 50**

**Course Objectives:**

To understand the nuances of scientific writing and develop skills in collation and presentation of scientific information along with learning the process of developing a research proposal/ project proposal

---

**Course Learning Outcomes:**

Student will be able to -

1. Demonstrate knowledge of scientific writing method and styles
2. Develop a research design on a topic relevant to their field
3. Prepare a systematic literature review on a select topic
4. Present a seminar of the literature review

The practical will have three components. Based on option of students for either dissertation or project work, due emphasis will be provided.

**A) Research design / Project proposal 12**

- Under the guidance of supervisor allocated prepare a research design / project proposal

**B) Skills in Technical Writing 24**

- Learn the nuances of select technical writing styles/ guides
- Analyze technical posters of researches in the fields
- Analyze dissertations, research reports and project evaluation reports and their presentations

**C) Review of Literature & Seminar 12**

- Prepare a literature review on a select topic using an approved style guide
- Conduct Plagiarism check of document prepared
- Present an oral seminar on the topic

**Suggested Readings:**

- Alley, M. (2018) *The Craft of Scientific Writing*. New York: Springer.
- Bernard, H.R. (2000). *Social Research Methods: Qualitative and Quantitative Approaches*. Thousand Oaks, CA: Sage
- Black, J.A. and Champion, D.J. (1976). *Methods and Issues in Social Research*. New York: John Wiley and Sons.
- Blaxter, L., Hughes, C, and Tight, K. (1999). *How to Research*. New Delhi: Viva books.
- Blum, D., Knudson M., and Henig, R. M. (2005) *Field Guide for Science Writers: The Official Guide of the National Association of Science Writers*. USA; Oxford University Press.  
<http://www.nasw.org/field-guide>
- Elmes, D.G., Kanowitz, B.H. and Roediger, H.L. (1989). *Research Methods in Psychology* (Third Edition). New York: West Publishing Company.
- <http://www.apastyle.org/>
- <http://www.citethisforme.com/guides>
- Katz, M. (2009) *From Research to Manuscript: A Guide to Scientific Writing (2<sup>nd</sup> Ed)*. New York : Springer

**RMDAEC31A: PRODUCT DESIGN AND DEVELOPMENT  
THEORY**

**Marks: 100**

**Duration: 3 Hrs.**

**Course Objectives:**

This paper will impart knowledge regarding materials and their application for creation of products and services. It strives to develop understanding concerning constructional details of

products with special reference to furniture and accessories. It will further help students apply ergonomic principles in design of products for higher user performance and comfort.

**Course Learning Outcomes:**

After completing this course, students will be able to:

1. Identify design problems and propose new and sustainable ideas for product development
2. Create schematic drawings, constructional details and product prototypes with focus is on up-cycling, refurbishment and re-cycling

**CONTENTS**

**PERIODS**

**UNIT I: Understanding Context of Product Development** **12**

- Need for product development, types of product and components, concerns and issues in the context of design
- Essentials for creating products – skills, knowledge, technology, economic viability, etc.
- Product attributes – form, function and aesthetic
- Exploration of elements of design in the context of a product and its environment
- Sustainable design practices, preserving traditional practices, designing for challenged communities

**UNIT II: Understanding Materials and Processes** **12**

- Understanding material behavior for furniture construction, product design and aesthetics – properties and finishes (wood, plastic, leather, paper, cloth, rubber, ceramic, glass, metal, bamboo, cane, composite materials, recycled materials)
- New and composite materials – application in product design and impact on environment
- Structural strength of materials and products made from them
- Relating design to materials and process of manufacture
- Application of materials and processes for the craft and industry sector

**UNIT III: Product Development Process and Service Rethinking** **12**

- Design methods
- Stages in design process
- Diffusion and innovation – new product ideas
- Integrated approach to new product development

**UNIT IV: Design Research** **12**

- Assessing market potentials for new products
- Market research, design research and user research
- Study of product life cycle and its relevance in new product design
- Product service system evaluation for a sustainable design

**Suggested Readings:**

- Aspelund, Karl (2006). *The Design Process*. New York: Fairchild Publications Inc.

- Doren, Harold V. (1954). *Industrial Design – A Practical Guide to Product Design and Development*. New York: McGraw-Hill Book Company.
- Jones, J. Christopher. (1996). *Design Methods: Seeds of Human Factors*. New York: John Wiley & Sons
- Jordan, Pat. (1998). *Human Factors in Product Design: Current Practice and Future Trends*. London: Taylor and Francis.
- Macleod, Dan. (1995). *The Ergonomics Edge: Improving Safety, Quality and Productivity*. New York: Nostrand Reinhold.
- Ulrich, K. T. & Eppinger, S.D. (2011). *Product Design and Development*. McGraw-Hill education
- W.S. Green & P.W. Jordan (Eds) (1999). *Human factors in product design: Current practice and future trends* (pp.206-217). London: Taylor & Francis.

**Teaching Plan:**

**Week 1:** Unit I: Need for product development, types of product and components, concerns and issues in the context of design

**Week 2:** Unit I: Essentials of creating products – skills, knowledge, technology, economic viability etc.

**Week 3:** Unit I: Product attributes – form, function and aesthetic

**Week 4:** Unit I: Exploration of elements of design in the context of use in products and product environment, Sustainable design practices, preserving traditional practices, designing for challenged communities

**Week 5:** Unit II: Understanding material behavior for furniture construction and product design and aesthetics – properties and finishes (wood, plastic, leather, paper, cloth, rubber, ceramic, glass, metal, bamboo, cane, composite and recycled materials

**Week 6:** Unit II: New and composite materials – application in product design and impact on environment

**Week 7:** Unit II: Application of materials and processes for the craft and industry sector

**Week 8:** Unit II: Structural strength of products. Relating design to materials and processes of manufacture

**Week 9:** Unit III: Design methods, Stages in design process

**Week 10:** Unit III: Diffusion and innovation – new product ideas, Integrated approach to new product development

**Week 11:** Unit IV: Assessing market potentials for new products, Market research and consumer research

**Week 12:** Unit IV: Study of product life cycle and its relevance in product design, Product service system evaluation for sustainability in design

**Facilitating Achievement of Course Learning Outcomes:**

Unit No.	Course Learning Outcomes	Teaching & Learning Activity	Assessment Tasks
1	Understanding the basic concepts for product development	Classroom lectures and power-point presentations, observations, demonstrations	Short assignment on attributes of products



	<p>Learning attributes of products</p> <p>Exploration of elements of design for product development</p>	<p>will be the primary teaching mode for understanding basic concepts for product development, product attributes and elements of design</p>	<p>Small exercise on exploring attributes of a few commonly used products</p>
2	<p>Understanding material behavior for product design and relating them to processes of manufacture</p> <p>Exploring new and composite materials for product design</p>	<p>Classroom lectures and power-point presentations, observations, will be used for understanding material behavior for product design and relating them to processes of manufacture and exploring new and composite materials</p> <p>Students will be shown a display of different materials for product design – identification, properties and application</p>	<p>Test on structural strengths of products, reference to standards on materials and specifications</p> <p>Quiz (spotting) for identification of materials for product design</p> <p>Case study assignment on application of materials and processes for the craft and industry sector</p>
3	<p>Understanding design methods and stages in design process</p> <p>Diffusion and innovation – new product ideas</p> <p>Learning integrated approach to new product development</p>	<p>Classroom lectures and power-point presentations, observations, demonstrations will be used for understanding design methods, stages in design process and integrated approach to new product development</p>	<p>Exercise on stages in design process using free hand drawing or graphic presentation</p> <p>Assignment on design diffusion and innovation using observations, market research, design research techniques and secondary review</p>
4	<p>Assessing market potentials for new products</p> <p>Market research and consumer research</p> <p>Study of product life cycle</p> <p>Product service system evaluation for sustainability in design</p>	<p>Classroom lectures and power-point presentations will be used for understanding product life-cycle and product service system evaluation</p>	<p>Case study assignment for assessing market potentials for new products by user and market survey</p>

**RMDAEC31A: PRODUCT DESIGN AND DEVELOPMENT  
PRACTICAL**

**Marks: 50**

**Duration: 3 Hrs.**

**Course Objectives:**

This paper will impart practical knowledge regarding materials and their application for creation of products. It will develop understanding concerning the design development process and the constructional details of products with special reference to furniture and accessories. It will further help students acquire proficiency in ergonomic design of products for improved performance and comfort.

**Course Learning Outcomes:**

After completing this course, students will be able to:

1. Develop an attitude towards innovation in design – perception, idea sketching, mock-ups
2. Know about materials available for product design
3. Work on design development, modeling and prototyping

**CONTENTS**

**PERIODS**

<b>UNIT I: Development of attitude towards design appreciation</b>	<b>10</b>
<ul style="list-style-type: none"><li>• Brain storming &amp; synectics to develop creative attitude</li><li>• Understanding design opportunity, problem perception and evaluation of concept</li><li>• Idea sketching, mock-ups, clustering of ideas for concept development, refinement and detailing</li></ul>	
<b>UNIT II: Product lifecycle</b>	<b>5</b>
<ul style="list-style-type: none"><li>• Life-cycle assessment of selected products</li></ul>	
<b>UNIT III: Product materials</b>	<b>5</b>
<ul style="list-style-type: none"><li>• Survey on new, composite and conventional materials available for product design</li><li>• Analyzing materials for their suitability in product design</li></ul>	
<b>UNIT IV: Design for special needs</b>	<b>14</b>
<ul style="list-style-type: none"><li>• Assessing special needs for different situations and applications</li><li>• Designing product for people with special needs</li></ul>	
<b>UNIT V: Portfolio - Product prototyping</b>	<b>14</b>
<ul style="list-style-type: none"><li>• Design portfolio indicating the processes for product development</li><li>• Design development, modeling and prototyping</li></ul>	

**Suggested Readings:**

- Aspelund, Karl (2006). *The Design Process*. New York: Fairchild Publications Inc.
- Doren, Harold V. (1954). *Industrial Design – A Practical Guide to Product Design and Development*. New York: McGraw-Hill Book Company.

- Jones, J. Christopher. (1996). *Design Methods: Seeds of Human Factors*. New York: John Wiley & Sons
- Jordan, Pat. (1998). *Human Factors in Product Design: Current Practice and Future Trends*. London: Taylor and Francis.
- Macleod, Dan. (1995). *The Ergonomics Edge: Improving Safety, Quality and Productivity*. New York: Nostrand Reinhold.
- Ulrich, K. T. & Eppinger, S.D. (2011). *Product Design and Development*. McGraw-Hill education
- W.S. Green & P.W. Jordan (Eds) (1999). *Human factors in product design: Current practice and future trends* (pp.206-217). London: Taylor & Francis.

## **RMDAEC32A: ADVANCED SPACE DESIGN AND ECOLOGY THEORY**

**Marks: 100**

**Duration: 3 Hrs.**

### **Course Objectives:**

This course focuses on methodological and technical approach to planning spaces and their application in building interiors. The students will gain information and understanding of styles for interior design and professional working drawings.

### **Course Learning Outcomes:**

After completing this course, students will be able to:

1. Understand the concept of space design and their application in building interiors.
2. Enable exploration of insights for a conducive socio-economic and environmental impact.
3. Give technical inputs in professional interior designing of residential and commercial spaces.

## **CONTENTS**

## **PERIODS**

### **UNIT I: Designing Sustainable Spaces**

**6**

- Structuring spaces for different uses
- Social and psychological context of space design
- Design efficiency in terms of pattern of movement and functionality
- Green building design and audit; LEED, GRIHA and BREEAM rating systems
- Energy efficiency in building construction – techniques and materials
- Modular system in construction of buildings

### **UNIT II: Building Specifications**

**12**

- Building specifications for residential and commercial space design as per NBC, and Master plan
- Specific requirements for designing retail spaces - offices & showrooms
- Space planning for selected events - exhibitions and expos, seminars and conferences areas.
- Design parameters for creating universal spaces with focus on inclusivity (people with

special needs, elderly, infants and children).

**UNIT III: Space Designing for Interior Services** **12**

- Lighting design for different spaces
- False Ceilings: construction techniques
- Acoustics: Types of acoustic design and materials, sound transmission, reverberation and propagation
- Air Conditioning: duct design and layout plan
- Fire safety: Types, Evacuation plans
- Types of security services in buildings

**UNIT IV: Restoration and Repair of Heritage properties** **8**

- Types of heritage structures
- Role of agencies involved in restoration of heritage properties
- Elements of restoration
- Development of architectural styles and trends in India and around the world (Focus on Indian Palaces/Forts etc);
- Building as a Learning Aids (BaLA)

**UNIT V: Project Estimation** **10**

- Specifications of materials
- Estimating & budgeting: Types of cost estimations and preparing estimates and budgets
- Proposals & tenders
- Site management - Sourcing/ outsourcing
- Implementation of plan of work and meeting deadlines
- Record keeping & filing

**Suggested Readings:**

- Bureau of Indian Standards. (2016). National Building code of India, Vol.1 & 2.
- DeChiara, J., Panero, J. & Zelnik, M. (2011). *Time Saver Standards for Interior Design and space planning, second edition*. McGraw Hill education
- Goel, S., Seetharaman, P. & Kakkar, A. (2015). Manual on Interior space designing, Elite publishing house
- Jain, V. K . (2016). Fire Safety in Buildings, New age publishers
- Klaus,K. (2006). Semantic turn a new foundation for design, CRC press
- Lynn M. Jones ,Phyllis S. Allen. (2009). Beginning of interior environments, Pearsons

**Teaching Plan:**

**Week1:** Understanding types of spaces, its psychology on users

**Week2:** Specific requirements of spaces for different users

**Week3:** Understanding Bye-laws for interior spaces in context of interior designing and its significance

**Week4:** Design requirements for inclusive space design approach

**Week5:** Understanding space planning for exhibition areas

**Week6:** Types of lighting schemes as per design theme and typology

- Week7:** False ceiling, AC ducting construction techniques  
**Week8:** Heritage structures in the country, their economic significance  
**Week 9:** Role of agencies in conserving heritage properties  
**Week10:** Types of estimates, specifications, budgeting.  
**Week11:** Preparing project appraisal report and record keeping  
**Week12:** Feedback, revision and discussion

**Facilitating the achievement of Course Learning Outcomes:**

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Understanding structure of Space and Sustainable Design with reference to design efficiency and functionality.	Self-directed: Read journal articles, books to collate information on usage of sustainable space  Classroom lectures	Comment on a selected article's  Evaluate different types of spaces and their usage through power point presentations.
2	Building Specifications	Classroom lectures,	Prepare a list of building standards as per any standard specifications.
3	Space Designing for Interior Services	Classroom lecture,  Site visits	Illustrate different types of building services in plans
4	Restoration and Repair of Heritage properties	Classroom lecture,  Site visit	Group presentation on restored heritage buildings
5	Project Estimation	Reading CPWD standards  Classroom lectures	Preparing an estimate of the given project

**RMDAEC32A: ADVANCED SPACE DESIGN AND ECOLOGY  
PRACTICAL**

**Marks: 50**

**Duration: 3 Hrs.**

**Course Objectives:**

This course focuses on providing practical knowhow on methodological and technical approach to planning spaces and their application in building interiors. The students will learn about the styles for interior design and gain skills in professional working drawings.

### Course Learning Outcomes:

After completing this course, students will be able to:

1. Visualize and draw various theme based interior and exterior design projects.
2. Create working and presentation drawings for community and commercial projects manually as well as on computer aided software.
3. Professionally plan and design interiors for space projects.

### CONTENTS

### PERIODS

#### UNIT I: Design Transition

10

- Survey on design transition reflecting user needs
- Site visit to study different types of user friendly designs

#### UNIT II: Design Project

32

- **Presentation drawings** - Floor plans of Commercial / Retail Offices, public areas of hotels, stand alone restaurants, gymnasiums, health clubs, sports complex, etc.
- **Working drawings**  
Drawing for interior service plans like Electrical layout, reflected ceiling plans , wall treatment for temperature control and acoustic, electrical planning and other furnishing details
- **Perspective drawing**
- Drawing perspective views of interiors including colour scheme and rendering pencil and colour

#### UNIT III: Estimation and Costing

6

- Preparing budgetary estimates and costing of interior materials, lights, fixtures etc. of the selected project.

#### Suggested readings:

- Ching, F. D. K . (2014). Building construction illustrated, Wiley, New Jersey
- DeChiara, J., Panero, J. & Zelnik, M. (2011). *Time Saver Standards for Interior Design and space planning, second edition*. McGraw Hill education
- Goel, S., Seetharaman, P. & Kakkar, A. (2015). Manual on Interior space designing ,Elite publishing house
- Shah, M. G., Kale, C. M., Building drawing, 5<sup>th</sup> edition, Tata McGraw Hill publishing, New Delhi.

### RMDAEC31B: SUSTAINABLE HABITAT CONCEPT & PRACTICES

#### THEORY

Marks: 100

Duration: 3 Hrs.

#### Course Objectives:

This course aims to provide an understanding of the concept of sustainable habitat, its components and growth, policies and programs for sustainable habitat. Familiarize students with energy and resource use by buildings, auditing resource use in buildings, net zero buildings and

develop an understanding of green building guidelines and norms.

**Course Learning Outcomes:**

After completing this course, students will:

1. Understand the concept and importance of sustainable habitat, policies and programs for sustainable habitat
2. Learn about resource use by buildings, resource auditing, impact of buildings on the environment
3. Understand concept, criteria and implementation of green building guidelines and norms

**CONTENTS**

**PERIODS**

**UNIT I: Sustainable habitat**

**12**

- Concept of sustainable habitat- meaning, importance and need, impact of built environment on natural resources
- Components and growth of sustainable habitat, Policies and programs for sustainable habitat-national urban housing and habitat policy, national rating system for green buildings, national mission for sustainable habitat

**UNIT II: Buildings and resources**

**12**

- Energy and resource use by buildings - sustainable and otherwise, energy intensive components of buildings, buildings as resource guzzlers
- Impact of building materials on environment
- Energy efficiency and energy conservation in sustainable habitat, material use, water sensitive design, waste water treatment, Resource audit of buildings – focus on energy and water auditing
- Net zero buildings – Concept, importance, practices and case studies

**UNIT III: Green Rating guidelines: GRIHA**

**12**

- Basic guidelines and norms, ECBC code
- Basics of GRIHA: Background, footprint and registration process
- GRIHA rating systems (SVAGRIHA, GRIHA LD, GRIHA EB, GRIHA AH, GRIHA Prakriti guidelines) – background, documentation and implementation
- Criteria details: Intent, appraisals and compliances
- GRIHA case studies and success stories

**UNIT IV: Green rating guidelines: LEED**

**12**

- Basics of LEED USGBC and LEED IGBC: Background, footprint and registration process
- LEED USGBC rating systems (BD+C, O+M, ND, Homes etc.) – background and implementation
- LEED IGBC rating systems (New buildings, Existing buildings, Homes, Schools, Factory etc.) – background and implementation
- Credit details: Intent, requirements, approach and methodologies

- LEED case studies and success stories

### **Suggested Readings:**

- Cottrell, M. *Guidebook to the LEED Certification Process: For LEED for New Construction, LEED for Core and Shell, and LEED for Commercial Interiors*
- GRIHA. (2010). *Introduction to National Rating System - GRIHA An evaluation tool to help design, build, operate, and maintain a resource-efficient built environment*. Ministry of New & Renewable Energy and TERI: New Delhi.
- Rider, T. R. *Understanding Green Building Guidelines: For Students and Young Professionals*.
- Sinha and Rajiv K. Margaret Greenway. (2004). *Green Technology for Environmental Management and Sustainable Development*. Jaipur: Pointer
- US Green Building Council. *LEED Reference Guide for Building Design and Construction*. USGBC.

### **Teaching Plan:**

**Week 1:** Concept and characteristics of human settlements, Basic concept of sustainable habitat, meaning, importance and need for sustainable habitat

**Week 2:** Components and growth of sustainable habitat, Policies and programs for sustainable habitat-National urban housing and habitat policy, national rating system for green buildings, national mission for sustainable habitat

**Week 3:** Energy and resource use by buildings - sustainable and otherwise, energy intensive components of buildings, buildings as resource guzzlers, Impact of building materials on environment

**Week 4:** Energy efficiency and energy conservation in sustainable habitat, material use, water sensitive design, waste water treatment

**Week 5:** Energy auditing, Energy Productivity, Net zero buildings – Concept, importance, practices and case studies

**Week 6:** Basic guidelines and norms, ECBC code, Basics of GRIHA: Background, footprint and registration process

**Week 7:** GRIHA rating systems (SVAGRIHA, GRIHA LD, GRIHA EB, GRIHA AH, GRIHA Prakriti guidelines) – background, documentation and implementation

**Week 8:** Criteria details: Intent, appraisals and compliances, GRIHA case studies and success stories

**Week 9:** Basics of LEED USGBC and LEED IGBC: Background, footprint and registration process, LEED USGBC rating systems (BD+C, O+M, ND, Homes etc.) – background and implementation

**Week 10:** LEED IGBC rating systems (New buildings, Existing buildings, Homes, Schools, Factory etc.) – background and implementation (Unit – 4)

**Week 11:** Credit details: Intent, requirements, approach and methodologies, LEED case studies and success stories (Unit – 4)

**Week 12:** Revision and clarification of doubts



**Facilitating the achievement of Course Learning Outcomes:**

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Understand the concept and importance of sustainable habitat, policies and programs for sustainable habitat	Unit transaction through power point presentations	Assignments, Open book test
2	Learn about resource use by buildings, resource auditing, impact of buildings on the environment	Unit transaction through power point presentations and classroom discussion	Quizzes and objective test
3, 4	Understand concept, criteria and implementation of green building guidelines and norms	Unit transaction through power point presentations and classroom discussion	Assignments, Open book test

**RMDAEC31B: SUSTAINABLE HABITAT CONCEPT & PRACTICES  
PRACTICAL**

**Marks: 50**

**Duration: 3 Hrs.**

**Course Objectives:**

This course aims to provide an understanding of the concept of sustainable habitat, its components and growth, policies and programs for sustainable habitat. Familiarize students with energy and resource use by buildings, auditing resource, net zero buildings and develop and understanding of green building guidelines and norms.

**Course Learning Outcomes:**

After completing this course, students will:

1. Develop understanding of the importance of sustainable habitat
2. Develop skills in resource auditing of buildings
3. Develop understanding of the green building guidelines and norms in terms of their implementation

**CONTENTS**

**PERIODS**

**UNIT I:** Basic calculations of resource consumption in buildings (like energy consumption, water consumption, landscape water demand etc.). **12**

**UNIT II:** Resource auditing of buildings. **12**

**UNIT III:** Critical evaluation and analysis of green buildings through case study approach to assess the green initiatives undertaken. **12**

**UNIT IV:** Compilation of strategies and technologies to implement credits/criteria for an in-depth understanding of the various green building rating systems. **8**

**UNIT VI:** Field visits to various green buildings. **4**

**Suggested Readings:**

- Green Building A to Z: Understanding the Language of Green Building – October 1, 2007 by Jerry Yudelson
- Kubba, S. *LEED Practices, Certification, and Accreditation Handbook*.
- Redclift, M., 2005, Sustainable Development (1987-2005): An Oxymoron Comes of Age, Wiley Interscience
- Trivedy R.K; (2004). *Handbook of Environmental Laws, Acts, Guidelines, Compliances and Standards*"; 2nd Ed, Hyderabad: Book Seller

**RMDAEC32B: CAPACITY BUILDING FOR SUSTAINABLE DEVELOPMENT  
THEORY**

**Marks: 100**

**Duration: 3 Hrs.**

**Course Objectives:**

The course will equip students in turning sustainable development from concept into practice. The course will address capacity gaps in diagnosing sustainability problems to envisioning alternative future outcomes, creating and implementing transition pathways, monitoring progress and adapting based on what has been learned.

**Course Learning Outcomes:**

After completing this course, students will:

1. Understand the fundamentals of organizational capacity building
2. Develop skills in capacity building
3. Be able to institutionalise capacity building

**CONTENTS**

**PERIODS**

**UNIT I: Conceptual framework and Organizational learning** **12**

- Introduction to Capacity Building
- Capacity Building and Policy Development

**UNIT II: Organizational capacity development** **15**

- Organizational flexibility and change
- Knowledge generation and acquisition
- Technical skills, goal – oriented focus
- Inter-organizational relations-connectedness, trust, communication, information sharing, advocacy & innovation

**UNIT III: Interventional Strategies for sustainable development** **15**

- Targeting and building critical mass
- Training Need Assessment (TNA)

- Training methodologies
- ICT for sustainable development
- Training Evaluation

#### UNIT IV: Institutionalizing capacity building Programmes

6

- Approaches to lab to land transfer

#### Suggested Readings:

- Bemmerlein-Lux, F. & Bank, P. (2011). *Lessons Learnt & Tools Applied A Working Book on Capacity Building Approaches in India*. Germany: GIZ.
- Bluementhal, B. (2003). *Investing in Capacity Building: A Guide to High-Impact Approaches*.
- James, V. U. (2018). *Capacity building for sustainable development*. UK: CAB International.
- Kenny, S., Clarke, M. (Eds.). (2010). *Challenging Capacity Building Comparative Perspectives*. UK: Palgrave Macmillan UK.

#### Teaching Plan:

**Week 1:** Introduction to Capacity Building

**Week 2:** Capacity Building and Policy Development

**Week 3:** Organizational flexibility and change

**Week 4:** Knowledge generation and acquisition

**Week 5:** Technical skills, goal – oriented focus

**Week 6:** Inter-organizational relations-connectedness, trust, communication, information sharing, advocacy & innovation

**Week 7:** Targeting and building critical mass

**Week 8:** Training Need Assessment (TNA)

**Week 9:** Training methodologies

**Week 10:** Training methodologies, ICT for sustainable development

**Week 11:** Training Evaluation

**Week 12:** Institutionalizing capacity building Programmes: Lab to land and Revision

#### Facilitating the achievement of Course Learning Outcomes:

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Understand the fundamentals of organizational capacity building	Unit transaction through power point presentations	Assignments, Open book test
2, 3	Develop skills in capacity building	Unit transaction through power point presentations and classroom discussion, designing capacity	Quizzes and objective test

		building programmes	
4	Be able to institutionalise capacity building	Unit transaction through power point presentations and classroom discussion	Assignments, Open book test, quizzes

## **RMDAEC32B: CAPACITY BUILDING FOR SUSTAINABLE DEVELOPMENT PRACTICAL**

**Marks: 50**

**Duration: 3 Hrs.**

### **Course Objectives:**

The course will help students attain proficiency in developing and strengthening the skills, abilities, processes and resources that organizations and communities need to survive, adapt, and thrive in the fast-changing world.

### **Course Learning Outcomes:**

After completing this course, students will:

1. Demonstrate organizational capacity building strategies
2. Plan and conduct capacity building programmes
3. Develop suitable ICT material

### **CONTENTS**

### **PERIODS**

**UNIT I:** Critical evaluation of organizational capacity building through case studies and visits. **10**

**UNIT II: Developing skills in:** **15**

- Targeting
- TNA
- Transacting different training methodologies
- Develop ICT material for sustainable development
- Training Evaluation

**UNIT III:** Develop Capacity building Programmes. **10**

**UNIT IV:** Advocacy and networking for institutionalising capacity building programmes. **8**

**UNIT V:** Field visits. **5**

### **Suggested Readings:**

- Blumenthal, Barbara. (2003) Investing in Capacity Building: A Guide to High-Impact Approaches. The Foundation Center.

- Connolly, Paul M. (2006) Navigating the Organizational Lifecycle: A Capacity-Building Guide for Nonprofit Leaders. Washington D.C: Board Source.

**RMDAOE31: ENTREPRENEURSHIP & INNOVATION  
THEORY**

**Marks: 100**

**Duration: 3 Hrs.**

**Course Objectives:**

The purpose of this course is to develop an entrepreneurial mind set and gain insights about the critical role of creativity and innovation to the development of new products and services in entrepreneurial start-ups.

**Course Learning Outcomes:**

After completing this course, students will:

1. Develop an entrepreneurial mind set
2. Ideate an innovative business proposition
3. Create business plans for a start-up or an existing organization

**CONTENTS**

**PERIODS**

**UNIT I:** Entrepreneurship and the Entrepreneurial process - developing the Entrepreneurial Perspective, Stimulating Creativity; Creative Teams **5**

**UNIT II:** Sources of Innovation in Business; Managing Organizations for Innovation and Positive Creativity **5**

**UNIT III:** Business Modeling and New Venture Creation: **8**

- Identifying a problem or market opportunity
- Process of launching a new venture, in a corporate setting or as a new start-up
- Developing business models, forming a team, analyzing markets, financing, assessing the competitive environment, and talent acquisition.

**UNIT IV:** Strategies for New Venture Growth; **6**

- The Valuation Challenge in Entrepreneurship
- Exit strategies for a New Venture and Trends in India
- Intrapreneurship in Action

**Suggested Readings:**

- Chesbrough, H. (2006). Open business model: How to thrive in the new innovation landscape. Harvard Business School Press.
- CN Prasad, Small and Medium Enterprises in Global Perspective, New century Publications, New Delhi
- Drucker, P. F. (2006). Innovation and entrepreneurship: Practice and principles. USA: Elsevier.

- Fagerberg, J., Mowery, D. C., & Nelson, R. R. (Ed.). (2006). The Oxford Handbook of innovation. New Delhi: Oxford University Press.
- Kaplan, J. M. (2006). Patterns of entrepreneurship. John Wiley & Sons.
- Roy, R. (2008) Entrepreneurship. New Delhi: Oxford University Press.

**Teaching Plan:**

**Week 1:** Entrepreneurship and the Entrepreneurial process - developing the Entrepreneurial Perspective

**Week 2:** Stimulating Creativity; Creative Teams

**Week 3:** Sources of Innovation in Business

**Week 4:** Managing Organizations for Innovation and Positive Creativity

**Week 5:** Identifying a problem or market opportunity

**Week 6:** Process of launching a new venture, in a corporate setting or as a new start-up

**Week 7:** Developing business models

**Week 8:** Forming a team, analyzing markets, financing, assessing the competitive environment, and talent acquisition

**Week 9:** The Valuation Challenge in Entrepreneurship

**Week 10:** Exit strategies for a New Venture and Trends in India

**Week 11:** Intrapreneurship in Action

**Week 12:** Revision and clarification of doubts

**Facilitating the achievement of Course Learning Outcomes:**

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1, 2	Develop an entrepreneurial mind set	Unit transaction through power point presentations and classroom discussion	Assignments, Open book test
3	Ideate an innovative business proposition	Unit transaction through power point presentations, classroom discussion, case studies, ideation activities	Quizzes and objective test
4	Create business plans for a start-up or an existing organization	Unit transaction through power point presentations, classroom discussion, business plan development	Assignments, Open book test

## **SEMESTER IV**

## **RMDACC415: DISSERTATION II / EXPERIENTIAL LEARNING PROJECT**

**(External Board, Viva and Internal Evaluation)**

**Marks: 150**

### **Course Objectives:**

To develop skills in conducting a research study/ working in a project and learn the process of writing a dissertation/ project report

### **Course Learning Outcomes:**

Student will be able to -

1. Know the practical aspects of, collecting data/ project work
2. Evaluate, select and use appropriate strategies for reduction, analysis and presentation of data collected during research process/ project work
3. Suitably illustrate data/ insights using various graphical and other methods.
4. Prepare a dissertation document/ project report based on research process/ project work done.

Students will be given an option of doing either

A) Dissertation or B) Project work in a chosen area congruent to their discipline/ field of study.

The work will be an original effort.

## **RMDAEC41A: DESIGN CLINIC AND AUDIT THEORY**

**Marks: 100**

**Duration: 3 Hrs.**

### **Course Objectives:**

This paper will develop acumen to identify design problems and find appropriate solutions for given situations or products. To equip students for integration of sustainable design of products and services and develop analytical ability by augmenting design audits for feasibility, viability and sustainability of their designs.

### **Course Learning Outcomes:**

After completing this course, students will be able to:

1. Identify design problems and find appropriate solutions using life-cycle assessment approach.
2. Critically analyze and evaluate designs for safety, ergonomics, functionality and sustainability by audit of products.

## **CONTENTS**

## **PERIODS**

### **UNIT I: PRODUCT SEMANTICS**

**12**

- Theories of product semantics
- Concept of product emotion, value and attachment
- Development of a logical design approach
- Concept of product identity



- Usability and user experience

## **UNIT II: DESIGN AS A MANAGEMENT TOOL**

**10**

- Design evaluation, designer attributes, setting up a design office
- Finding clients, business correspondence
- Management of design process
- Human factors in managing design/team work
- Professional practice in design
  - Design brief – letter of contract
  - Ethics
  - Costing for the designed product or service and fee estimation
- Patent and design registration laws and procedure

## **UNIT III: PRODUCT INTERFACE DESIGN**

**14**

- Investigations and study of visual, functional and ergonomic requirements of product design
- Study of the processes of building interactions
- Experiential ideation
- Activity analysis – structuring of content
- Human factors in design
- User-centred design
- Participatory design
- Scenario building – linear and animatic storyboarding
- Prototyping and design
- Evaluating user interfaces
- Design for complex systems and environments

## **UNIT IV: PRODUCT ANALYSIS AND AUDIT**

**12**

- Product Analysis – diachronic and synchronic
- Understanding and analysing contexts – parallel and future situations
- Design service
- Evaluation of design guidelines
- Design audit

### **Suggested Readings:**

- Gandotra, V. et al. (2013). *Essentials of Ergonomics*, Dominant Publishers: Delhi
- John, T. (2005). In the bubble: designing in a complex world
- Jordan, Pat. (1998). *Human Factors in Product Design: Current Practice and Future Trends*. London: Taylor and Francis.
- Krippendorff, K. (2006). *The Semantic Turn: A new foundation for design*. Boca Raton, London, New York: Taylor & Francis, CRC Press.
- Macleod, Dan. (1995). *The Ergonomics Edge: Improving Safety, Quality and Productivity*. New York: Nostrand Reinhold.
- Mugge, R. (2008). *Emotional Bonding with Products: Investigating Product Attachment from a Design Perspective*. VDM Verlag

- Norman, D.A. (2004). *Emotional Design: Why we love (or hate) everyday things*. New York, NY: Basic Books.
- Norrid, B and Wilson, J.R. (2001). *Designing Safety into Products*. London: Taylor and Francis.
- William, L. (2003). *Universal Principles of design*, Rockport.
- Wilson, J.R. and Covlett, N. (2001). *Evaluation of Human Work: A Practical Ergonomics Methodology*. London: Taylor and Francis

**Teaching Plan:**

**Week 1:** Unit I: Theories of product semantics

**Week 2:** Unit I: Concept of product emotion, value and attachment, Development of a logical design approach

**Week 3:** Unit I: Concept of product identity, Usability and user experience

**Week 4:** Unit II: Design evaluation, designer attributes, setting up a design office, Finding clients, business correspondence

**Week 5:** Unit II: Management of design process, Human factor in managing design/team work

**Week 6:** Unit II: Professional practice in design: Design brief – letter of contract, Ethics, Costing design and fee estimation, Patent and design registration laws and procedure

**Week 7:** Unit III: Investigations and study of visual, functional and ergonomic requirements, Study of the process of building interactions

**Week 8:** Unit III: Human factor in design, User centred design process

**Week 9:** Unit III: Participatory design, Experiential ideation

**Week 10:** Unit III: Activity analysis – structuring of content, Scenario building – linear and animatic storyboarding, Prototyping and design, Evaluating user interfaces

**Week 11:** Unit IV: Product Analysis – diachronic and synchronic, Understanding and analysing contexts – parallel and future situations

**Week 12:** Unit IV: Design service - Evaluation of design guidelines, Design audit, Design for complex systems and environments

**Facilitating Achievement of Course Learning Outcomes:**

Unit No.	Course Learning Outcomes	Teaching & Learning Activity	Assessment Tasks
1	<p>Understanding theories of product semantics</p> <p>Learning the concepts of product emotion, value and attachment</p> <p>Understanding development of a logical design approach</p> <p>Exploring concept of product identity, usability and user experience</p>	<p>Classroom lectures and power-point presentations will be the primary teaching mode for understanding theories of product semantics, concepts of product emotion, value and attachment, product identity, usability and user experience</p> <p>A small exercise on development of a logical</p>	<p>Short assignment on theories of product semantics</p> <p>Test on concepts of product emotion, value and attachment</p>

		design approach	
2	<p>Understanding design as a management tool</p> <p>Exploring professional practice in design</p> <ul style="list-style-type: none"> <li>▪ Design brief – letter of contract</li> <li>▪ Ethics</li> <li>▪ Costing design and fee estimation</li> </ul> <p>Patent and design registration laws and procedure</p>	<p>Classroom lectures and power-point presentations will be used for understanding design as a tool for management, professional practice in design</p> <p>Case study of patented and registered design to explore and learn the requirements and procedures for design patent and registration</p>	<p>Case study assignment on professional practices in design</p> <p>Making a design brief – letter of contract</p>
3	<p>Understanding product interface design –</p> <ul style="list-style-type: none"> <li>• investigations and study of visual, functional and ergonomic requirements</li> <li>• Human factor in design</li> <li>• User centred design process</li> <li>• Participatory design</li> <li>• Experiential ideation</li> <li>• Activity analysis – structuring of content</li> </ul> <p>Scenario building – linear and animatic storyboarding and prototyping</p>	<p>Classroom lectures and power-point presentations will be used for understanding product interface design and scenario building</p> <p>Case study of scenario building and understanding linear and animatic storyboarding through demonstration on black/white boards</p>	<p>An exploratory assignment on human factors in design – interview product users</p> <p>Building a design scenario on paper using linear and animatic storyboarding</p>
4	<p>Understanding product analysis and audit</p> <p>Evaluation of design guidelines</p>	<p>Classroom lectures and power-point presentations will be used for understanding product analysis and audit and evaluation of design guidelines</p>	<p>Case study assignment for evaluation of design guidelines</p>

**RMDAEC41A: DESIGN CLINIC AND AUDIT  
PRACTICAL**

**Marks: 50**

**Duration: 3 Hrs.**

**Course Objectives:**

This paper will equip students with the competence to identify design problems and find appropriate solutions. Enable them to develop analytical ability to audit designs for feasibility, viability and sustainability. It will help acquire proficiency in working with different materials and prototyping.

**Course Learning Outcomes:**

After completing this course, students will be able to:

1. Develop acumen to critically evaluate design problems and finding solutions
2. Develop expertise in working on variations of improvised products and prototyping

**CONTENTS**

**PERIODS**

**UNIT I: Product analysis**

**12**

Critical analysis of products with respect to

- design audit
- sustainability audit
- safety audit
- ergonomic audit

**UNIT II: User interface design**

**15**

User interface design portfolio

- Critical evaluation of existing product
- Finding solution to design problems
- Sketches and design of improvised product

**UNIT III: Prototyping product**

**15**

Prototyping new product based on improvised design of user-interface

**UNIT IV: Variations of product**

**6**

Working on variations or different formats of the new product

**Suggested Readings:**

- Jordan, Pat. (1998). *Human Factors in Product Design: Current Practice and Future Trends*. London: Taylor and Francis.
- Krippendorff, K. (2006). *The Semantic Turn: A new foundation for design*. Boca Raton, London, New York: Taylor & Francis, CRC Press.
- Macleod, Dan. (1995). *The Ergonomics Edge: Improving Safety, Quality and Productivity*. New York: Nostrand Reinhold.
- Mugge, R. (2008). *Emotional Bonding with Products: Investigating Product Attachment from a Design Perspective*. VDM Verlag

- Norman, D.A. (2004). *Emotional Design: Why we love (or hate) everyday things*. New York, NY: Basic Books.
- Norrid, B and Wilson, J.R. (2001). *Designing Safety into Products*. London: Taylor and Francis.
- Wilson, J.R. and Covlett, N. (2001). *Evaluation of Human Work: A Practical Ergonomics Methodology*. London: Taylor and Francis

## **RMDAEC42A: ERGONOMICS: HUMAN CENTRED DESIGN THEORY**

**Marks: 100**

**Duration: 3 Hrs.**

### **Course Objectives:**

This course is centered on understanding human capabilities and limitations as applied to designing workspaces, work methods and jobs for optimum safety, efficiency, productivity and comfort. It involves the application of ergonomic principles in addressing various ergonomic concerns. Occupational safety and hazard analysis also forms an integral aspect of this course.

### **Course Learning Outcomes:**

After completing this course student will be able to:

1. Comprehend the ergonomic principles to design comfortable and efficient workspaces
2. Acquire knowledge in handling ergonomic related problems and design user-centered products
3. Apprehend anthropometry and its role in industrial design
4. Comprehend principles of kinesiology and biomechanics for improved posture and well-being
5. Understand the breadth and scope of occupational ergonomics through assessment of human interaction in work environment system

## **CONTENTS**

## **PERIODS**

### **UNIT 1: Introduction and overview of ergonomics**

**10**

- Definition, importance and scope
- Ergonomic models, methods, tools and techniques
- Ergonomic risk factors
- Work related ergonomic problems (safety, accuracy, speed, reliability, comfort)
- Human factors: work efficiency and performance
- User-centered design

### **UNIT 2: Anthropometry & Biomechanics**

**10**

- Anthropometric measurements
- Static and dynamic anthropometry, anthropometric application in design development and evaluation
- Kinesiology and biomechanics, human leverage system and its mechanical benefits, biomechanics and posture for various tasks

### **UNIT 3: Workplace ergonomics and design**

**14**

- Work station and equipment design, balance of space, flow of work, time and motion studies
- Job design and analysis, evaluation of work, warnings and risk communication in work
- Product design & analysis
- Indices of comfort in internal environment – temperature, ventilation, humidity, lighting, noise, vibration, flooring, clothing, materials and finishes

### **UNIT 4: Occupational ergonomics and safety in living spaces**

**14**

- Performance appraisal, performance related problems
- Health and safety, health monitoring protective equipment, safe work practices, safety of equipment, occupational hazards
- Occupational safety analysis
- Ergonomic standards and legislations for health and safety
- Perspectives in rehabilitation ergonomics

#### **Suggested Readings:**

- Bhattacharya, A., McGlothlin J.D. (2012). *Occupational Ergonomics: Theory and Applications*. CRC Press. (Unit 4)
- Bridger, Robert S. (2009). *Introduction to Ergonomics*. 3rd ed., CRC Press. (Unit 1)
- Hedge, A. (2017). *Ergonomic Workplace Design for Health, Wellness, and Productivity*. CRC Press, Taylor & Francis Group. (Unit 3 & 4)
- Knudson, D. (2007). *Fundamentals of Biomechanics*. 2nd ed., Springer Science Business Media, LLC. (Unit 2)
- Pheasant, S., Haslegrave, C.M. (2006). *Bodyspace: Anthropometry, Ergonomics, and the Design of Work*. Taylor & Francis. (Unit 1 and 2)
- Salvendy, G. (2012). *Handbook of Human Factors and Ergonomics*. 4th ed., Wiley Publications. (Unit 1 and 3)

#### **Teaching Plan:**

**Week 1:** Unit 1: Introduction and overview of ergonomics - Definition, importance and scope, Ergonomic models, methods, tools and techniques, Ergonomic risk factors

**Week 2:** Unit 1: Introduction and overview of ergonomics - Work related ergonomic problems (safety, accuracy, speed, reliability, comfort), Human factors: work efficiency and performance

**Week 3:** Unit 1: Introduction and overview of ergonomics - User-centered design, Unit 2: Anthropometry & Biomechanics - Anthropometric measurements

**Week 4:** Unit 2: Anthropometry & Biomechanics - Static and dynamic anthropometry, anthropometric application in design development and evaluation

**Week 5:** Unit 2: Anthropometry & Biomechanics - Kinesiology and biomechanics, human leverage system and its mechanical benefits, biomechanics and posture for various tasks

**Week 6:** Unit 3: Workplace ergonomics and design - Work station and equipment design, balance of space, flow of work, time and motion studies

**Week 7:** Unit 3: Workplace ergonomics and design - Time and motion studies, Job design and analysis, evaluation of work, warnings and risk communication in work

**Week 8:** Unit 3: Workplace ergonomics and design - Product design & analysis, Indices of comfort in internal environment – temperature, ventilation, humidity, lighting

**Week 9:** Unit 3: Workplace ergonomics and design - Indices of comfort in internal environment – noise, vibration, flooring, clothing, materials and finishes, Unit 4: Occupational ergonomics and safety in living spaces - Performance appraisal, performance related problems

**Week 10:** Unit 4: Occupational ergonomics and safety in living spaces - Health and safety, health monitoring protective equipment, safe work practices, safety of equipment, occupational hazards

**Week 11:** Unit 4: Occupational ergonomics and safety in living spaces - Occupational safety analysis

**Week 12:** Unit 4: Occupational ergonomics and safety in living spaces - Ergonomic standards and legislations for health and safety, Perspectives in rehabilitation ergonomics

**Facilitating the achievement of Course Learning Outcomes:**

Unit No.	Course Learning Outcomes	Teaching & Learning Activity	Assessment Tasks
1	<ul style="list-style-type: none"> <li>Ability to handle ergonomic related problems and design user-centered products</li> </ul>	Classroom lectures and Power-point presentations will be the primary teaching mode for understanding basic concepts in ergonomic design and its related components	Quiz on ergonomic models, work related ergonomic problems and user-centered design
2	<ul style="list-style-type: none"> <li>Understand anthropometry and its role in industrial design</li> <li>Comprehend principles of kinesiology and biomechanics for improved posture and well-being</li> </ul>	<p>Classroom lectures and power-point presentations will be used for understanding basic concepts in anthropometry, kinesiology and biomechanics</p> <p>Students will also be shown educational videos on application of such concepts (anthropometry, kinesiology and biomechanics) in enhancing workspace design and improving posture.</p>	<p>Test on various anthropometric measurements and their application in product and workspace design</p> <p>Case study assignment on application of kinesiology and biomechanics in building efficient workspaces</p>
3	<ul style="list-style-type: none"> <li>Knowledge of ergonomic principles to design comfortable and efficient workspaces</li> </ul>	Classroom lectures and power-point presentations will be used for understanding the basic ergonomic principles as applied to workspace design.	<p>Short assignment on workplace ergonomics and design</p> <p>Quiz on indices of</p>

			indoor comfort
4	<ul style="list-style-type: none"> <li>Understand the breadth and scope of occupational ergonomics through assessment of human interaction in work environment system</li> </ul>	<p>Classroom lectures and power-point presentations will be used for understanding the scope of occupational ergonomics</p> <p>Videos showcasing various occupational hazards will be shown to the students followed by an active discussion on safe work practices</p> <p>Students will also be taken on field to give them hands-on exposure</p>	<p>Power-point presentation on various occupations and their related hazards (summary of student's field visit)</p>

**RMDAEC42A: ERGONOMICS: HUMAN CENTRED DESIGN  
PRACTICAL**

**Marks: 50**

**Duration: 3 Hrs.**

**Course Objectives:**

This practical focuses on development of ergonomically designed workspaces, products and equipment through extensive user-centered research and design. It also explores traditional as well as contemporary methods and techniques employed for user safety, efficiency and comfort.

**Course Learning Outcomes:**

After completing this course student will be able to:

1. Evaluate anthropometric measurements of users in terms of space and product design
2. Build ergonomically designed workstations and products using user-centered research and design methods
3. Assess human energy efficiency through time and motion studies
4. Develop a project on occupational safety and health

**CONTENTS**

**PERIODS**

**UNIT 1: Anthropometry**

**6**

- Assessing application of anthropometric measurements in creating efficient workspaces, products and equipment
- Developing anthropometric data for different users using an anthropometer



**UNIT 2: Workstation & Product Design** **24**

- Developing checklists, questionnaires, interview schedules to study user behaviour and attitudes – for rehabilitation and design of workplaces
- Creating ergonomically designed products/ workstation (prototypes) using user-centered research and design methods

**UNIT 3: Time & Motion Studies** **6**

- Evaluating distance travelled by a worker during a task using pathway chart
- Assessing sequence of steps in a process for identifying possible areas of improvement using a process chart

**UNIT 4: Project** **12**

- Exploring different occupations and their related components-workplace design, equipment used, hazards and safety practices
- Equipment design (prototype) for different occupations

**Suggested Readings:**

- Bhattacharya, A., McGlothlin J.D. (2012). *Occupational Ergonomics: Theory and Applications*. CRC Press.
- Gandotra, V. et al. (2013). *Essentials of Ergonomics*, Dominant Publishers: Delhi
- Hedge, A. (2017). *Ergonomic Workplace Design for Health, Wellness, and Productivity*. CRC Press, Taylor & Francis Group.
- Wilson, J.R. and Covlett, N. (2001). *Evaluation of Human Work: A Practical Ergonomics Methodology*. London: Taylor and Francis

**RMDAEC43A: PROFESSIONAL PRACTICES IN DESIGN & START-UPS  
THEORY**

**Marks: 100**

**Duration: 3 Hrs.**

**Course Objectives:**

This paper will help students to consolidate their knowledge acquired during the course and convert into a start up in design. They will understand the finer details required by a professional practitioner of design.

**Course Learning Outcomes:**

After completing this course, students will be able to:

1. Comprehend the importance of startups and identification of business opportunities
2. Develop a portfolio of a design professional
3. Create competence for initiating own startups

**CONTENTS**

**PERIODS**

**UNIT I: Design Industry Connect** **14**

- Interacting with design related industries(interior products and design related, event design and decor, landscape design, facilities and services management, new product development, furniture design, upcycling, refurbishing or recycling industries and so on) with respect to

- manpower and work profile
- consultation and advice
- product development strategy
- design approach
- Engaging with real life projects
- Development of a future project with commercial promise for a specific design industry
- Develop a network of collaboration with relevant industries

## **UNIT II: Protecting Intellectual Property Rights 6**

- Understanding the relevance and process (laws and procedures) of Intellectual Property Rights: Patents, Copy right, Industrial design, Trademark, service mark, Layout designs of integrated circuits, Geographical indication
- Applying for appropriate IPR to protect the design from plagiarism

## **UNIT III: Initiating a startup 18**

- Exploring a startup idea or a business opportunity through market assessment and consumer research. ability
  - Developing feasible idea through conceptualization, ideation and innovation
  - Checking feasibility in terms of technology, market potential, finance and human resources
- Developing personal and professional portfolio covering technical, social, economic and environmental aspects
- Marketing and branding: market segmentation, USP, brand building
- Identifying structure for the startup organization: sole proprietorship, partnership, limited company, co-operative, franchise or social enterprises
- Identifying challenges and solving problems for a successful startup
- Registration process: selecting a company name, acquiring digital signature certificate (DSC) and Director Identification Number (DIN), filling relevant forms with supporting documents, registration of the startup
- Government programmes and policies supporting startups

## **Unit IV: Costing and Financial Planning 10**

- Preparing cost estimates for technical, manpower and other resources; recurring and non-recurring; rate of return and break-even analysis; overheads / operational costs
- Financial analysis, support systems and funding: sources of funding, costing and budgeting, formal and informal sources of support, networking
- Legal & ethical compliance: regulations, taxation, business ethics
- Writing a business plan

### **Suggested Readings**

- *How to start a startup: The Silicon Valley playbook for entrepreneurs.* (2016). San Francisco, CA: PlatoWorks.
- *Life Orientation Computer skills hands on training: MS Office 2010, 4* (Vol. 2). (2014). Mowbray: Future Managers.

- S Reum, C., & Reum C. (2018). *Shortcut your startup: Speed up success with unconventional advice from the trenches*. New York: GalleryBoks/Jeter Publishing.
- Viki, T. (2017). *The corporate startup: How established companies can develop successful innovation ecosystems* (Vol. 1). Deventer: Vakmedianet.

**Teaching Plan:**

**Week 1:** Unit I: Design Industry Connect - Interacting with design related industries (interior products and design related, event design and decor, landscape design, facilities and services management, new product development, furniture design, upcycling, refurbishing or recycling industries and so on) with respect to manpower and work profile, consultation and advice, product development strategy, design approach

**Week 2:** Unit I: Design Industry Connect - Engaging with real life projects, Development of a future project with commercial promise for a specific design industry

**Week 3:** Unit I: Design Industry Connect - Develop a network of collaboration with relevant industries

**Week 4:** Unit II: Protecting Intellectual Property Rights - Understanding the relevance and process (laws and procedures) of Intellectual Property Rights: Patents, Copy right, Industrial design, Trademark, service mark, Layout designs of integrated circuits, Geographical indication

**Week 5:** Unit II: Protecting Intellectual Property Rights - Applying for appropriate IPR to protect the design from plagiarism

**Week 6:** Unit III: Initiating a startup - Exploring a startup idea or a business opportunity through market assessment and consumer research - Developing feasible idea through conceptualization, ideation and innovation, Checking feasibility in terms of technology, market potential, finance and human resources

**Week 7:** Unit III: Initiating a startup - Developing personal and professional portfolio covering technical, social, economic and environmental aspects, Marketing and branding: market segmentation, USP, brand building

**Week 8:** Unit III: Initiating a startup - Identifying structure for the startup organization: sole proprietorship, partnership, limited company, co-operative, franchise or social enterprises, Identifying challenges and solving problems for a successful startup

**Week 9:** Unit III: Initiating a startup - Registration process: selecting a company name, acquiring digital signature certificate (DSC) and Director Identification Number (DIN), filling relevant forms with supporting documents, registration of the startup, Government programmes and policies supporting startups

**Week 10:** Unit IV: Costing and Financial Planning, Preparing cost estimates for technical, manpower and other resources; recurring and non-recurring; rate of return and break-even analysis; overheads / operational costs

**Week 11:** Unit IV: Costing and Financial Planning - Financial analysis, support systems and funding: sources of funding, costing and budgeting, formal and informal sources of support, networking, Legal & ethical compliance: regulations, taxation, business ethics

**Week 12:** Unit IV: Costing and Financial Planning - Writing a business plan

### Facilitating the Achievement of Course Learning Outcomes:

Unit No.	Course Learning Outcomes	Teaching & Learning Activity	Assessment Tasks
1	<ul style="list-style-type: none"> <li>Developing a basic understanding for startups and professional practices with life projects.</li> <li>Understanding commercial feasibility and developing networks with relevant industries.</li> </ul>	<p>Classroom lectures and power-point presentations will be the primary mode of teaching.</p> <p>Case study methods will be used to initiate discussion among the class.</p> <p>Field visits to various organizations</p>	<p>Test on basic concepts of startup and professional practices</p> <p>Developing future projects based on a product/service/ event</p>
2	<ul style="list-style-type: none"> <li>Understanding Legal and Ethical compliance of a Design startup</li> <li>Developing knowledge about IPR for protecting designs</li> </ul>	<p>Classroom lectures, group discussions and power-point presentations will be used for understanding various fundamentals of a startups and</p> <p>Students will also be taken for field visits to give them hands-on exposure</p>	<p>Test on relevance and process of IPR</p> <p>Preparation of documents and filling of IPR form (Govt. of India)</p>
3	<ul style="list-style-type: none"> <li>Developing skills for assessing market in terms of technology, finance, innovation and resources.</li> <li>Developing an understanding of professional and personal portfolios</li> <li>Understanding the structure and registration procedure for a startup</li> </ul>	<p>Classroom lectures and power-point presentations will be used for understanding the procedure for registering for a startup</p> <p>Primary and Secondary data survey will also be used for greater insight.</p>	<p>The registration form available online for ‘Startup India’ will be used to guide students about various heads.</p> <p>Case profiling of successful and unsuccessful startups to check for their feasibility, ideation, finance and innovation</p>
4	<ul style="list-style-type: none"> <li>Learning cost estimation and budgeting for any startup.</li> <li>Developing an</li> </ul>	<p>Classroom lectures and power-point presentations will be used for understanding costing and finance</p>	<p>Preparation of a Business Plan for the</p>

	<p>understanding for funding – sources, procedure and networking.</p> <ul style="list-style-type: none"> <li>• Ability to analyze and write business plans</li> </ul>	<p>Secondary data analysis of Existing business plans, financial reports and funding documents for developing knowledge of legal and ethical compliance.</p>	<p>product / service/ event</p>
--	---	--	---------------------------------

**RMDAEC43A: PROFESSIONAL PRACTICES IN DESIGN & START-UPS  
PRACTICAL**

**Marks: 50**

**Duration: 3 Hrs.**

**Course Objectives:**

This practical focuses on development of presentation and communication skills through interactive software’s and on-field experience. It also focuses on developing business proposal for understanding essential elements of a startups.

**Course Learning Outcomes:**

After completing this course, students will be able to:

1. Acquire professional skills for a startup
2. Comprehend dynamics and challenges associated with startups

**CONTENTS**

**PERIODS**

**UNIT I: Design Interactions**

**14**

- Interacting with design related industries (interior products and design related, event design and decor, landscape design, facilities and services management, new product development, furniture design, upcycling, refurbishing or recycling industries and so on)
  - Engaging with real life projects
  - Development of a future project with commercial promise
  - Develop a network of collaboration
- Developing a personal and professional portfolio

**UNIT II: Developing Presentation and Communication skills**

**12**

- Professional skills for presentation of design project
- Case studies of successful startups/enterprises

**UNIT III: Preparation of Business Plan/ Portfolio Design**

**22**

Project - preparing a business plan for a startup including financial analysis, legal & ethical compliance, marketing and branding

- Registering the startup
- Execution of the startup

**Suggested Readings:**

- Mohan, K., Mohan, K. & Banerji, M. (2009). Developing *communication skills*. New Delhi, India: Macmillan India.

- Steward, R.D., & Steward, A.L. (1992). *Proposal preparation*. New York: Wiley

## **RMDAEC41B: POLICIES & PRACTICES FOR SUSTAINABLE DEVELOPMENT THEORY**

**Marks: 100**

**Duration: 3 Hrs.**

### **Course Objectives:**

The course aims to sensitize the students towards indicators and measures of sustainable development, give knowledge of and capacity to analyze policies and practices for sustainable development of different sectors, management strategies for water, waste, energy etc., and understand the components and techniques of EIA.

### **Course Learning Outcomes:**

After completing this course, students will:

1. Gain insight into the need, indicators and measures of sustainable development along with challenges and responses
2. Understand and critically analyze policies and practices regarding various sectors- energy, air, water, waste, agriculture, etc.
3. Gain knowledge of water management systems, water quality parameters, waste water management, rainwater harvesting
4. Gain knowledge of technologies of waste management, health impact, policy for MSW management, energy recovery from waste
5. Understand the components & techniques of EIA, legislative aspects, current practices & constraints

## **CONTENTS**

## **PERIODS**

### **UNIT I: Concept of sustainable development**

**8**

- Concept of sustainability, principles, dimensions of sustainability - social, economic and technological; changing perspective, promoting sustainable development
- Need, indicators and measures for sustainable development
- Challenges to Sustainable Development- agriculture, population, food security, public health, education, natural resources, climate change
- Responses to sustainable development: Public Policy (Community Participation and Participatory Learning), gender and human rights, technology etc.
- Evolution, approaches, interpretation of SDGs, overall policy environment

### **UNIT II: Energy management and sustainable development**

**12**

- Relationship between energy, environment and economic development
- Energy budgeting of earth's atmosphere, programs and policies for energy management, Energy use and global climate change, GHG emissions, climate change debate
- Legislations guiding energy sector and Energy scenario in India, Policies and practices regarding various sectors- air, water, waste, agriculture, forests and bio-diversity
- Policies and practices, Issues and challenges, current potential, future prospects in conventional and non-conventional energy resources -Coal and lignite, natural gas, petroleum products, nuclear energy and their environmental issues; Non-conventional energy sources -

need, sources and significance- Solar thermal energy; Solar photovoltaic, bio-energy, hydroelectricity, tidal power, wind energy, wave energy, geothermal energy

**UNIT III: Water management: Policy, Practices and technologies** **10**

- Need and importance of water management systems, surface and ground water management, water quality parameters
- Water pollutants and their health impact
- Waste water management systems: techniques and technologies
- Rainwater harvesting: need and principle

**UNIT IV: Waste management: Policy, Practices and technologies** **10**

- Need and importance of waste management, quantum, classification, present scenario of disposal, technologies used for waste management, health impact
- Solid waste management Policy for MSW, Biomedical waste, e-waste and other hazardous waste
- Energy recovery from wastes and environment – RDF, waste to energy plants etc.

**UNIT V: Assessing Environmental Impacts** **8**

- Environmental Impacts – examples, need for assessment, difficulties
- The EIA Approach – Background, Objectives, Components & Techniques
- Environmental impact assessment- importance, significance, steps, procedure to be followed, role of Government and non-governmental organizations
- EIA in India – Legislative aspects, Current practices & Constraints, way forward

**Suggested Readings:**

- International Energy Agency (2017). *Energy Technology Perspectives 2017*, Paris, International Energy Agency, June
- Kishore, V. V. N. (2008). *Renewable energy engineering and technology – A knowledge compendium*. TERI Press: New Delhi.
- Sachs, Jeffrey D. (2015). *The Age of Sustainable Development*. New York, NY, Columbia University Press
- Scruton, Roger. (2012). *How to Think Seriously about the Planet: The Case for an Environmental Conservatism*, Oxford, Oxford University Press
- United Nations (2015), *Transforming our world: the 2030 Agenda for Sustainable Development* [Resolution adopted by the General Assembly on 25 September 2015], 70/1, New York, NY, UN General Assembly

**Teaching Plan:**

**Week 1:** Concept of sustainability, principles, dimensions of sustainability - social, economic and technological; changing perspective, promoting sustainable development, Need, indicators and measures for sustainable development

**Week 2:** Challenges to Sustainable Development- agriculture, population, food security, public health, education, natural resources, climate change, Responses to sustainable development: Public Policy (Community Participation and Participatory Learning), gender and human rights, technology etc.

**Week 3:** Evolution, approaches, interpretation of SDGs, overall policy environment, Relationship between energy, environment and economic development

**Week 4:** Energy budgeting of earth's atmosphere, programs and policies for energy management, Energy use and global climate change, GHG emissions, climate change debate, Legislations guiding energy sector and Energy scenario in India, Policies and practices regarding various sectors- air, water, waste, agriculture, forests and bio-diversity

**Week 5:** Policies and practices, Issues and challenges, current potential, future prospects in conventional and non-conventional energy resources -Coal and lignite, natural gas, petroleum products, nuclear energy and their environmental issues; Non-conventional energy sources - need, sources and significance- Solar thermal energy; Solar photovoltaic, bio-energy, hydroelectricity, tidal power, wind energy, wave energy, geothermal energy

**Week 6:** Need and importance of water management systems, surface and ground water management, water quality parameters, Water pollutants and their health impact

**Week 7:** Waste water management systems: techniques and technologies, Rainwater harvesting: need and principle

**Week 8:** Need and importance of waste management, quantum, classification, present scenario of disposal, technologies used for waste management, health impact, Solid waste management Policy for MSW, Biomedical waste, e-waste and other hazardous waste

**Week 9:** Energy recovery from wastes and environment – RDF, waste to energy plants etc.

**Week 10:** Environmental Impacts – examples, need for assessment, difficulties, The EIA Approach – Background, Objectives, Components & Techniques

**Week 11:** Environmental impact assessment- importance, significance, steps, procedure to be followed, role of Government and non-governmental organizations, EIA in India – Legislative aspects, Current practices & Constraints, way forward

**Week 12:** Revision and clarification of doubts

**Facilitating the achievement of Course Learning Outcomes:**

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Gain insight into the need, indicators and measures of sustainable development along with challenges and responses	Unit transaction through power point presentations	Assignments, Open book test
2	Understand and critically analyze policies and practices regarding various sectors- energy, air, water, waste, agriculture, etc.	Unit transaction through power point presentations and classroom discussion	Quizzes and objective test
3	Gain knowledge of water management systems, water quality parameters, waste water management, rainwater harvesting	Unit transaction through power point presentations and classroom discussion using case studies	Assignments, Open book test
4	Gain knowledge of technologies	Unit transaction through	Assignments,



	of waste management, health impact, policy for MSW management, energy recovery from waste	power point presentations and classroom discussion using case studies	Open book test
5	Understand the components & techniques of EIA, legislative aspects, current practices & constraints	Unit transaction through power point presentations and classroom discussion using case studies	Class assignments and quizzes

**RMDAEC41B: POLICIES & PRACTICES FOR SUSTAINABLE DEVELOPMENT  
PRACTICAL**

**Marks: 50**

**Duration: 3 Hrs.**

**Course Objectives:**

The course aims to impart practical knowledge to critically analyze policies and practices for sustainable development of different sectors, management strategies for water, waste, energy etc, and understand the components and techniques of EIA.

**Course Learning Outcomes:**

After completing this course, students will:

1. Understand the government initiatives and practices in the areas of air, energy, water and waste and develop skills in evaluating them
2. Calculate rain water harvesting potential, solar energy potential of buildings/spaces
3. Develop skills in using latest techniques in EIA

**CONTENTS**

**PERIODS**

**UNIT I: Critical evaluation of government initiatives on sustainable development 10**

Critical evaluation of government initiatives on sustainable development to produce a policy brief or a policy discussion paper. Focus areas may include, but are not limited to, policy analysis (context, history, objectives, framework and the process of policy formulation), linkages of the identified policy with other goals (SDGs etc.), implementation challenges (internal resistance, technical capacity, institutional and political perspectives, information etc.), outcomes and recommendations for potential modification of the policies. Students will also understand stakeholder engagement and participation in both planning and implementation of policies and program (stakeholders will include- business and industry, consumers, environmental and social activists/think tanks etc.)

**UNIT II: Case studies on the following topics: 10**

- Government efforts towards monitoring of air quality and controlling air pollution
- Government initiatives on renewable energy and its usage in commercial, institutional and residential units
- Water harvesting scenario in Delhi including types of users
- Solid waste management practices/waste to energy plants/bio-medical waste management/e-waste management

<b>UNIT III:</b> Calculation of rainwater harvesting potential, roof top solar potential etc.	<b>6</b>
<b>UNIT IV:</b> Developing skills in using latest techniques in EIA.	<b>10</b>
<b>UNIT V:</b> Case studies on EIA for different sectors.	<b>8</b>
<b>UNIT VI:</b> Field visits.	<b>4</b>

**Suggested Readings:**

- Boyle, G. (2004). Renewable Energy: Power for a Sustainable Future. Oxford University Press, UK.
- Boyle, G., Everett, B. and Ramage, J. (Editors) (2003). Energy Systems and Sustainability: Power for a Sustainable Future. Oxford University Press, UK.
- Lee, N. and C. Kirkpatrick (Eds). 2000. Integrated Appraisal and Sustainable Development in a Developing World. Cheltenham, Edward Elgar.
- Ristinen, R.A. and Kraushaar, J.J. (2006). Energy and the Environment. John Wiley & Sons, Inc., USA.

**RMDAEC42B: CLIMATE CHANGE & ECOSYSTEM: ISSUES & CONCERNS  
THEORY**

**Marks: 100**

**Duration: 3 Hrs.**

**Course Objectives:**

The course aims to impart knowledge about science and policy of climate change along with climate vulnerabilities on different systems. Understanding the adaptation and mitigation strategies to deal with climate change for different sectors along with policy framework for controlling climate change will be an important aspect of the course.

**Course Learning Outcomes:**

After completing this course, students will:

1. Understand concept of climate change, components of climate change system, global warming-causes and consequences
2. Understand vulnerabilities and impact of climate change on different systems
3. Gain insight into adaptation and mitigation strategies for different sectors
4. Understand policies and programs –global and national to control climate change

**CONTENTS**

**PERIODS**

<b>UNIT I: Concept and science of climate change</b>	<b>10</b>
<ul style="list-style-type: none"> <li>• History and evidence of climate change</li> <li>• Components of climate change system, nutrient cycles, Biosphere and geosphere</li> <li>• Greenhouse effect and greenhouse gases – their sources</li> <li>• Global warming- causes, consequences, greenhouse effect, GHG emissions-sources and sinks, GHG emissions-global, in developed and developing countries</li> </ul>	

## **UNIT II: Climate Change –global and regional scenario** **8**

- Natural and human induced causes of climate change
- Recent issues in climate change (ozone hole, melting of glaciers, atmospheric brown clouds)
- Global scenario, climate resilience, natural resource management, future impacts of climate change

## **UNIT III: Vulnerabilities and Impacts of climate change** **15**

- Impacts of climate change along with sectoral vulnerabilities on both natural and managed systems both present and projected on various sectors
  - ❖ Agriculture, forestry and bio-diversity
  - ❖ Human health, infrastructure, industry.
  - ❖ Water resources, sea level rise
  - ❖ Extreme events
- Adaptation options for each sector, factors affecting adaptation, strategies, constraints and consequences
- Mitigation strategies for various sectors- transport, energy, agriculture, forestry, industry, infrastructure, water resources etc., stabilisation scenario, mitigation options, programmes and initiatives, mitigation and sustainable development linkages
- Climate change mitigation programmes in energy and industry sector -: Case studies with focus on India

## **UNIT IV: Policies, approaches and programs for controlling climate change** **15**

- International efforts and policy frameworks -history, objectives, activities, equity issues, Key issues in multilateral negotiations on climate change, international protocols, role and outcomes of UNFCCC, IPCC
- India's national policy framework, NAPCC-targets and achievements, PAT (Perform, Achieve, and Trade) scheme, Forest certification (FSC, SFI, PEFC), Supply chain management for sustainable products
- CO<sub>2</sub> sequestration, forests and other sinks in India, opportunities and concerns
- The global carbon market, Carbon Pricing, Carbon Tax, Emission reduction certificates

### **Suggested Readings:**

- Agarwal, S.K. (2003) *Environmental Scenario for 21st Century*. New Delhi: APH
- Climate Change: Causes, Effects and Solutions - Hardy, John (2003), John Wiley & Sons
- Climate change: perspectives five years after Kyoto – Velma Grover (ed.) (2004), Hamilton, Ontario, Canada, ISBN 978-1-57808-326-8
- IPCC, Assessment Reports 4 (AR4)
- Meteorology Today: An Introduction to Weather, Climate, and the Environment – Ahrens, C D, Brooks Cole, 7th Ed. (2002)
- Paris Agreement (2015) [Agreement adopted on 12 December 2015 at the twenty-first session of the Conference of the Parties to the United Nations Framework Convention on Climate Change], United Nations Treaty Collection, Chapter XXVII Environment, New York, NY, United Nations

**Teaching Plan:**

**Week 1:** History and evidence of climate change, Components of climate change system, nutrient cycles, Biosphere and geosphere

**Week 2:** Greenhouse effect and greenhouse gases – their sources, Global warming- causes, consequences, greenhouse effect, GHG emissions-sources and sinks, GHG emissions-global, in developed and developing countries

**Week 3:** Natural and human induced causes of climate change

**Week 4:** Recent issues in climate change (ozone hole, melting of glaciers, atmospheric brown clouds)

**Week 5:** Global scenario, climate resilience, natural resource management, future impacts of climate change

**Week 6:** Impacts of climate change along with sectoral vulnerabilities on both natural and managed systems both present and projected on various sectors

**Week 7:** Adaptation options for each sector, factors affecting adaptation, strategies, constraints and consequences

**Week 8:** Mitigation strategies for various sectors- transport, energy, agriculture, forestry, industry, infrastructure, water resources etc., stabilisation scenario, mitigation options, programmes and initiatives, mitigation and sustainable development linkages

**Week 9:** Climate change mitigation programmes in energy and industry sector -: Case studies with focus on India

**Week 10:** International efforts and policy frameworks -history, objectives, activities, equity issues, Key issues in multilateral negotiations on climate change, international protocols, role and outcomes of UNFCCC, IPCC

**Week 11:** India's national policy framework, NAPCC-targets and achievements, PAT (Perform, Achieve, and Trade) scheme, Forest certification (FSC, SFI, PEFC), Supply chain management for sustainable products

**Week 12:** CO<sub>2</sub> sequestration, forests and other sinks in India, opportunities and concerns, The global carbon market, Carbon Pricing, Carbon Tax, Emission reduction certificates, Revision

**Facilitating the achievement of Course Learning Outcomes:**

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1	Understand concept of climate change, components of climate change system, global warming-causes and consequences	Unit transaction through power point presentations and classroom discussion	Quizzes and objective test
2	Understand vulnerabilities and impact of climate change on different systems	Unit transaction through power point presentations and classroom discussion using case studies	Assignments, Open book test
3	Gain insight into adaptation and mitigation	Unit transaction through power point presentations and classroom	Assignments, Open book test

	strategies for different sectors	discussion using case studies	
4	Understand policies and programs – global and national to control climate change	Unit transaction through power point presentations and classroom discussion	Class assignments and quizzes

## **RMDAEC42B: CLIMATE CHANGE & ECOSYSTEM: ISSUES & CONCERNS PRACTICAL**

**Marks: 50**

**Duration: 3 Hrs.**

### **Course Objectives:**

The course aims to impart practical knowledge about issues and concerns related to climate change along with adaptation and mitigation strategies that can be taken by corporates, small and medium businesses, farmers and individual consumers. Further, it will impart skills for developing training programmes for climate change mitigation and adaptation to different sections of the population.

### **Course Learning Outcomes:**

After completing this course, students will:

1. Understand climate vulnerabilities of different regions
2. Appreciate the cause, impacts, adaptation and mitigation strategies for climate change
3. Develop skill in formulating strategies to mitigate and adapt to climate change
4. Develop skills in creating training programmes for different target groups towards reducing their carbon footprint

### **CONTENTS**

### **PERIODS**

**UNIT I:** Case studies on regional climate vulnerabilities and adaptation and mitigation strategies. **8**

**UNIT II:** Portfolio on climate change: causes, impacts, adaptation and mitigation strategies for different sectors. **10**

**UNIT III:** Appraisal of mitigation and adaptation practices to climate change through industry cluster approach. **10**

**UNIT IV:** Developing training programs for different target groups towards lifestyle changes for reducing carbon footprint. **15**

**UNIT V:** Field visits. **5**

### **Suggested Readings:**

- Gosling (2013) The likelihood and potential impact of future change in the large-scale climate-earth system on ecosystem services.

- IPCC (2007) Climate Change 2007: Working Group II: Impacts, Adaptation and Vulnerability, Working Group II, Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
- Kelkar, U., Bhadwal, S. (2007) South Asian Regional Study on Climate Change Impacts and Adaptation: Implications for Human Development. Human Development Report 2007/2008. Fighting Climate Change: Human Solidarity in a Divided World. Human Development Report Office, Occasional Paper.
- Kovats, S., Akhtar, R. (2008) Climate, climate change and human health in Asian cities. Environment and Urbanization 29 (1): 165-175.
- Low-Carbon Green Growth in Asia Policies and Practices: A Joint Study of the Asian Development Bank and the Asian Development Bank Institute. 2013.
- Pittock B (2009) Climate change: The science, impacts and solutions 2nd edition. CSIRO, Melbourne, and Earthscan, London.

**RMDAEC43B: HEALTH AND SAFETY IN BUILT ENVIRONMENT  
THEORY**

**Marks: 100**

**Duration: 3 Hrs.**

**Course Objectives:**

The course aims to sensitize the students towards the concept of health and safety in built environment, with specific reference to indoor environment and human health risk assessment.

**Course Learning Outcomes:**

After completing this course, students will:

1. Understand the health and safety issues in built environment with respect to indoor environmental quality
2. Develop skills to carry out risks assessment and vulnerability analysis
3. Get acquainted to environment and safety management

**CONTENTS**

**PERIODS**

**UNIT I: Introduction to concept of built environment**

**12**

- Definition and components of built environment
- Whole house approach to built environment
- Introduction to safety and health issues in built Environment
- Impact of physical planning and zoning on health and safety

**Unit II: Fundamentals of the Indoor Environment**

**12**

- Indoor environment parameters: IAQ, Thermal comfort, Lighting and Acoustics
- Health and comfort in the indoor environment
- Indoor air pollution – causes, effects, prevention & control technologies
- Standards pertaining to IAQ guidelines (e.g., ASHRAE, ISHRAE, USEPA, WHO etc.)
- Management of the indoor environment
- Impact of IEQ on occupants' health and productivity

**UNIT III: Human Health Risk Assessment (HHRA) 12**

- Introduction to Human Health Risk Assessment with reference to indoor and outdoor spaces
- Steps in Human health Risk Assessment: Risk identification, Exposure Assessment, Dose-Response Relationship, Risk Communication, Quantification of Human Health Risk Assessment, Human Health Risk Assessment with respect to air, water, soil and water pollution

**UNIT IV: Environment and Safety Management 12**

- Review and comparison of Global and Indian legal provisions related to Occupational Safety and Health including OSHA and Factories Act
- Introduction to HAZOP and HCCA Studies
- The Total Quality Environment Management
- Introduction to Total Productive Maintenance (TPM), Pillars of TPM

**Suggested Readings:**

- Abdul-Wahab, Sabah A. (Ed.). (2011). *Sick Building Syndrome in Public Buildings and Workplaces*.
- Godish, T. (1997). *Indoor Environmental Quality 1st Edition*.
- Maroni B. M., Lindvall, S. T. (1995). *Indoor Air Quality, Volume 3, 1st Edition, A Comprehensive Reference Book*.
- Murphy, M. (2006). *Sick Building Syndrome and the Problem of Uncertainty: Environmental Politics, Technoscience, and Women Workers*.
- Pluschke, P. (Ed.). (2004). *Indoor Air Pollution, Part F*.

**Teaching Plan:**

**Week 1:** Definition and components of built environment, Whole house approach to built environment

**Week 2:** Introduction to safety and health issues in built Environment, Impact of physical planning and zoning on health and safety

**Week 3:** Indoor environment parameters: IAQ, Thermal comfort, Lighting and Acoustics, Health and comfort in the indoor environment

**Week 4:** Indoor air pollution – causes, effects, prevention & control technologies

**Week 5:** Management of the indoor environment

**Week 6:** Impact of IEQ on occupants' health and productivity

**Week 7:** Introduction to Human Health Risk Assessment

**Week 8:** Steps in Human health Risk Assessment: Risk identification, Exposure Assessment, Dose-Response Relationship, Risk Communication, Quantification of Human Health Risk Assessment, Human Health Risk Assessment with respect to air, water, soil and water pollution

**Week 9:** Review and comparison of Global and Indian legal provisions related to Occupational Safety and Health including OSHA and Factories Act, Introduction to HAZOP and HCCA Studies

**Week 10:** The Total Quality Environment Management

**Week 11:** Introduction to Total Productive Maintenance (TPM), Pillars of TPM

**Week 12:** Revision and clarification of doubts

**Facilitating the achievement of Course Learning Outcomes:**

Unit No.	Course Learning Outcomes	Teaching and Learning Activity	Assessment Tasks
1, 2	Understand the health and safety issues in built environment with respect to indoor environmental quality	Unit transaction through power point presentations and classroom discussion	Quizzes and objective test
3	Develop skills to carry out risks assessment and vulnerability analysis	Unit transaction through power point presentations and classroom discussion using case studies	Assignments, Open book test
4	Get acquainted to environment and safety management	Unit transaction through power point presentations and classroom discussion using case studies	Assignments, Open book test

**RMDAEC43B: HEALTH AND SAFETY IN BUILT ENVIRONMENT  
PRACTICAL**

**Marks: 50**

**Duration: 3 Hrs.**

**Course Objectives:**

The course aims to impart practical skills in human risk assessment and hands on training on instrumentation in Indoor Air Quality (IAQ).

**Course Learning Outcomes:**

After completing this course, students will:

1. Understand the concept of human health risk assessment
2. Develop skills in using instrumentation for assessing IAQ
3. Demonstrate skills in working on IAQ modelling and GIS mapping

**CONTENTS**

**PERIODS**

<b>UNIT I:</b> Case Studies related to Human health risk assessment.	<b>10</b>
<b>UNIT II:</b> Demonstration Session I: Hands on training on Instrumentation in IAQ.	<b>12</b>
<b>UNIT III:</b> Demonstration Session II: IAQ Model software demonstration e.g. CONTAM.	<b>10</b>
<b>UNIT IV:</b> GIS Mapping Software.	<b>10</b>
<b>UNIT V:</b> Field visits.	<b>6</b>

**Suggested Readings:**

- Burroughs, H.E. & Hansen, S. J. (2011). *Managing Indoor Air Quality, 5th Edition.*



- Maroni, M., & Seifert, B., & Lindvall, T. (Eds.). (1995). *Indoor Air Quality: A Comprehensive Reference Book (Air Quality Monographs)*.
- Murphy, M. (2006). *Sick Building Syndrome and the Problem of Uncertainty: Environmental Politics, Technoscience, and Women Workers*.
- Pluschke, P. (Ed.). (2004). *Indoor Air Pollution, Part F*.
- Sherman, E. G. (2008). *Desktop GIS: Mapping the Planet with Open Source Tools 1st Edition*