

UNIVERSITY OF MUMBAI

No.UG/ICC/2013-14/80
MUMBAI- 400 032
13th December, 2013

The Principal,
College of Home Science,
Nirmala Naketan,
49, New Marine Line,
MUMBAI- 400 020.

Madam,

I am to inform you that the recommendation made by the Faculty of Science at its meeting held on 12th February, 2013 has been accepted by the Academic Council at its meeting held on 27th February, 2013 **vide** item No.4.24 and subsequently approved by the Management Council at its meeting held on 20th June, 21st June and 11th July, 2013 **vide** item No.13 and that in accordance therewith, in exercise of the powers conferred upon the Management Council under Section 54 (1) and 55 (1) of the Maharashtra Universities Act, 1994, the Ordinance 6050 and Regulations 8624, 8625 and syllabus as per the Credit Based Semester & Grading System for Branch IV: Community Resource Management (Management and Ergonomics) for Sem. I and Sem. II of M.Sc. programme in course of Home Science is introduced, which is available on the University's web site (www.mu.ac.in) and that the same has been brought into force with effect from the academic year 2013-14.

Yours faithfully,

Sd/-
Deputy Registrar
Under Graduate Studies

A.C/4.24/27/02/2013
M.C/13/20/06/2013,21/06/2013 &11/07/2013

No. UG/80-A of 2012-13 MUMBAI-400 032 13th December, 2013

Copy forwarded with compliments for information to :-

- 1) The Dean, Faculty of Science.
- 2) The Chairperson, **Ad-hoc** Board of Studies in Home Science.
- 3) The Director, Board of Colleges and University Development,
- 4) The Co-Ordinator, University Computerization Centre,
- 5) The Controller of Examinations.

Sd/-
Deputy Registrar
Under Graduate Studies

AC 27/2/13
Item no. 4.24

UNIVERSITY OF MUMBAI



Ordinances, Regulations and Syllabus

Program: M.Sc.

Course: Home Science

**Branch IV: Community Resource Management
Management and Ergonomics
Semester I and II**

(Introduced as per Credit Based Semester and Grading
System with effect from the academic year 2013–2014)

PROPOSED SYLLABUS

M.Sc. (Home Science) Course Branch IV: Community Resource Management

MANAGEMENT AND ERGONOMICS

Preamble

The Master's program has been innovatively designed to enable students to acquire knowledge in the field of Management, Ergonomics, Workplace Safety, Product and Equipment Design, Marketing, Human Resource Development, Entrepreneurship and Communication. The course curriculum has been structured to explore issues related to modern strategic developments and thereby provide a balance between theoretical and practical applications in the field of Community Resource Management to equip students for better job opportunities.

Objectives of the course:

- To develop the capabilities and knowledge of students in the areas of,
 - Human Resource Management
 - Financial Management
 - Work place design
 - Workplace safety
 - Anthropometry and design
 - Occupational Hazards
- To acquire relevant skills required to develop students to become efficient professionals in academics, research, industry and community service.
- To enhance communication skills and leadership skills to foster competence and excellence in students.

O 6050 Eligibility:

B.Sc. with Home Science (any branch)

B.Sc. with Home Economics

B.Sc. with Physiotherapy

B.Sc. Agriculture with Home Science

Graduate degree with Hotel Management/Hospitality Management/Housekeeping or other allied fields

PG Diploma in Interior Decoration/Interior Design

M.Sc. (Home Science)
BRANCH IV: COMMUNITY RESOURCE MANAGEMENT

MANAGEMENT AND ERGONOMICS

R 8624 STUDENT INTAKE CAPACITY: 30

R 8625 PROPOSED FEE STRUCTURE

S.NO.	HEAD	AMOUNT/STUDENT (Rs.)	
		M.Sc. I	M.Sc. II
1	TUITION FEES	25,000	25,000
2	LABORATORY FEES	1,500	1,500
3	LABORATORY DEPOSIT	500	0
4	LIBRARY FEES	2,000	2,000
5	LIBRARY DEPOSIT	500	0
6	GYMKHANA FEES	500	500
7	IDENTITY CARD	75	75
8	EXAMINATION FEES	500	500
9	MAGAZINE	100	100
10	PROSPECTUS (handbook, syllabus & application form)	200	0
11	PROJECT EVALUATION	0	500
12	CAUTION MONEY	500	0
13	UNIVERSITY REGISTRATION	825	0
14	UNIVERSITY SHARE OF TUITION FEES	800	800
15	FIELD VISITS*/ACTIVITIES	1,500	1,500
	TOTAL	34,500	32,475

* Additional charges will be levied for outstation visits/ conferences

M.Sc. (Home Science)
SEMESTER I
BRANCH IV: COMMUNITY RESOURCE MANAGEMENT
MANAGEMENT & ERGONOMICS

Course Code	Subject	Internal Marks	Semester End Examination	Total Marks	Periods/ Week	Credits
PSHSIV101	Research Methods & Statistics	40	60	100	4	4
PSHSIV102	Orderliness, Safety and Environment	30	45	75	3	3
PSHSIV103	Ergonomics in New Product and Equipment Design	30	45	75	3	3
PSHSIV104	Strategic Human Resource Management	30	45	75	3	3
PSHSIV105	Work Place Safety, Health and Environment	30	45	75	3	3
PSHSIV106	Entrepreneurship	20	30	50	2	2
PSHSIVP101	New Product Development	--	50	50	2	2
PSHSIVP102	Human Resource Management Applications	--	50	50	2	2
PSHSIVP103	Entrepreneurship	--	50	50	2	2
	TOTAL			600	24	24

Course Code	Title	Periods/week	Marks	Credits
PSHSIV101	RESEARCH METHODS AND STATISTICS	4	100	4

Objectives

- To build in students appreciation for high quality research in each of their specializations.
- To introduce students to the skills needed in conducting a research in their specialization.
- To introduce students to principles of good scientific writing.
- To enable in students the skills in selecting, computing, interpreting and reporting statistics.

Course Content	Periods
<p>Unit I</p> <p>Introduction and Overview What is a research? Objectivity and subjectivity in scientific inquiry: Premodernism, modernism, and postmodernism Steps in the research process Importance of research in general, and in each discipline Illustration of research in each of the three specializations: Foods, Nutrition, and Dietetics; Human Development; Textile and Fashion Technology; Community Resource Management. Qualitative versus quantitative research The beginning steps in the research process Identifying broad areas of research in a discipline Identifying interest areas; using multiple search strategies Prioritizing topics; specifying a topic; feasibility Review of literature/scholarly argument in support of study Specifying research objectives/hypotheses/questions</p>	15
<p>Unit II</p> <p>Variables Definition Characteristics Types Levels of measurement Measurement Conceptual definitions and operational definitions Types of validity and reliability in quantitative research Data entry in quantitative research Codebook and master sheet Creating data files and data management</p>	15
<p>Unit III</p> <p>Introduction and overview to statistics Role of statistics in (quantitative) research Definition/changing conceptions Prerequisite concepts in mathematics (e.g., properties of the summation sign, basic algebra) Descriptive Statistics for summarizing ratio level variables, frequencies and percentages Computing an average/measure of a central tendency: Mean, median, mode(s) Contrasting the mean vs. median Computing an average when there are outliers or extreme values in the data set Robust measures of the center (5% trimmed mean; M-estimators) Quartiles and percentiles Computing a measure of variability or dispersion Why? (inadequacy of the mean) Minimum value and maximum value Range Interquartile range Variance and standard deviation Discrete and continuous variables Histograms and line graphs</p>	15
<p>Unit IV</p> <p>Descriptive Statistics for summarizing nominal, ordinal and interval level variables Demonstration of computer software such as the Statistical Package for the Social Sciences (SPSS) Data entry Data Management Descriptive Statistics Probability: Foundation of Advanced/Inferential Statistics Definition Role of probability in research and statistics Elementary concepts in probability: Sample space, experiment, event/outcome/element of the sample space Equally likely outcomes and the uniform probability model Stabilization of the relative frequency</p>	15

References

- Bhattacharyya, G.K. and Johnson, R. A. (1977). *Statistical concepts and methods*. NY: John Wiley.
- Dwiwedi, R. S. (1997). *Research methods in behavioral sciences*. Delhi, Macmillan India.
- Gravetter, F. J. and Waillnau, L. B. (2000). *Statistics for the behavioral sciences*. Belmont, CA: Wadsworth/Thomson Learning.
- Kerlinger, F. N. and Lee, H. B. (2000). *Foundations of behavioral research*. Orlando, Florida: Harcourt.
- Leong, F.T.L. and Austin, J. T. (Eds.) (1996). *The psychology research handbook*. New Delhi: Sage.

Course Code	Title	Periods/week	Marks	Credits
PSHSIV102	ORDERLINESS, SAFETY AND ENVIRONMENT	3	75	3

Objectives

- To help identify the basic concepts of workplace exposure assessment.
- To be to recognize appropriate procedures and techniques for identifying health hazards in the workplace.
- To be able to list appropriate procedures and standards required to properly evaluate health hazards in selected workplaces.
- To reinforce the attitudes and behaviours required for safe and environmentally sound work habits.
- To explain the moral basis for maintaining good standards of health and safety.

Course Content		Periods
Unit I	Introduction Definition, Historical Perspective Occupational Safety, Health and Environment Management Role of Management in Industrial Safety Anticipation and Recognition: Safety Hazards Fire: Detection and Alarms Fire emergency procedures and means of escape Industrial Fire Protection Systems, Fire Safety In Buildings Anticipation and Recognition: Environment Hazards Particulates, Gases and Vapours, Noise, Radiation, Chemical Contaminants, Thermal Stress	15
Unit II	Evaluation and Control Workplace Control Principles Exposure Assessment Achieving Control: Control of Men, Materials And Vehicles into the plant and within the plant, Fire Alarm Facilities, Fire Detection And Sprinkler Systems, Formation Of Safety Teams, Basic First Aid, Internal Navigation Safety, Pathways for Men and Vehicles, Orderliness Organizing for Health and Safety – Management through commitments Key Personnel and their duties, Co-operation through communication, consultation and Committee, Principles of training, Training matrix Evaluation of Hazards Personal Protective Equipment and Clothing Occupational Health and Safety Program and Training Auditing and Reviewing Performance	15
Unit III	Employee Participation in Safety Health and Safety Policy: Purpose, Safety Policy/ Statement, Organization Arrangements Employee Participation, Purpose and areas of participation Role of worker union in Safety Health and Environment Protection. Safety Promotion, Suggestion Schemes, other Promotional Methods Health and Safety Induction Training: Reason for Induction Training, Training content, Methods of Induction	15

References

An Introduction to Health and Safety – Health and Safety in Small Businesses. HSE Books

Barry S. Levy, David W.H., Sherry L., Rosemary K., 2008. *Occupational and environmental health: recognizing and preventing disease and injury*.

Hughes P., Ed Ferrett (5th Edition). *Introduction to health and safety at work*. London and New York: Taylor and Francis

Lees F.P. (1996). *Loss prevention in process industries*. Butterworths and Co.

Mahajan S.P, (1993). *Pollution control in process industries*. New Delhi: Tata McGraw Hill Publishing Co.

R.S. Bridger (2003). *Introduction to ergonomics* (2nd Edition). London and New York: Taylor and Francis

R.S. Gupta. *A handbook of fire technology*. Orient Longman.

Course Code	Title	Periods/week	Marks	Credits
PSHSIV103	ERGONOMICS IN NEW PRODUCT AND EQUIPMENT DESIGN	3	75	3

Objectives

- To be able to evolve design concepts considering the end user.
- To understand the steps necessary to produce a viable product.
- To be able to differentiate between a plan on paper and the actual product.
- To understand legal issues involved in registering the design.
- To build the ability to work with Engineering and Science specialists and business management teams.

Course Content		Periods
Unit I	Introduction Importance and Need Stages of Design Research Process of Design Development: Defining Design Objectives Understanding Consumer Requirements Gathering User Requirement Knowing satisfaction level with existing products Opportunities for new features Product Concept Formulation Developing And Evaluating the Design: Quality Function Deployment, Converting Customer Voice to Specifics. User Centered Design Vs. Proactive Design	15
Unit II	Integration of Ergonomics in the design process Anthropometric principles: Anthropometric Data Analysis Applying Anthropometry for Product Design Ergonomic Principles: Designing for the Environment Designing for Comfort and Safety Cultural Ergonomics Issues	15
Unit III	Design and Development Intelligence, Creativity And Decision Making In Product Design Standards In Design Visual Design Face lifts Variants Platform New Platform Product Graphics Aesthetic Concepts Objectives Of Product Development Manufacturing Ability/ Feasibility Economic Aspects Product Promotion Product Development User Centered Deign Universal design Integration of special users in product development process Eco design Intellectual Property Rights Patent, Copyright and Trademark Procedure for Fling Patent Legal issues involved	15

References

Guy Kawasaki (2004). *The act of the start*.

Planchard, D.C. and Planchard M.P. (2011). *Engineering design with solid works : A step by step project based approach utilizing 3D solid modeling*. Kansas: Schroff Development Corporation Mission.

Ulrich, K.T. and Eppinger, S.D. (2011). *Product design and development* 5th Ed, McGraw Hill/Irwin.

Waldema Karwowski, M.M. Soares, N.A. Stanton. (2001). *Human factors and ergonomics in consumer product design: Methods and techniques*. USA: Taylor and Francis (CRC Press)

Course Code	Title	Periods/week	Marks	Credits
PSHSIV104	STRATEGIC HUMAN RESOURCE MANAGEMENT	3	75	3

Objectives

- To be able to understand Human Resource Management with a systemic, methodological and strategic perspective.
- To distinguish the Strategic Approach to Human Resources from the traditional functional approach.
- To understand the relevance of HRM to managers and employees in work organizations.
- To be able to appreciate Strategic Human Resource Management in the context of changing forms of organization.

Course Content		Periods
Unit I	Understanding Strategic Human Resource Management Traditional Vs. Strategic Human Resource Management Understanding Role of HR in Business Processes - Business Planning, Strategic Alignment, Supporting Organization, Reliable Process HR Strategy and Practices - Organizational Context, Investment Perspective Global environment of Human Resource Aligning Human Resources with Corporate/Business Strategy - Strategic Human Resource Management in Strategic policy Deployment Strategy Formulation Human Resource contribution to Strategy Workforce Utilization Role of HR in Organizational competency building	15
Unit II	Performance and Evaluation High Performance Approaches to Performance Compensation and Rewards management Evolving an appropriate compensation Evaluating - Overview and Scope, Quantitative and Qualitative, Approaches to Evaluation	15
Unit III	Emerging Strategic Human Resource Management Issues Corporate Ethics and Values Workforce Diversity Evaluating effectiveness of SHRM, HRM values and employee relations Human Resource Outsourcing Talent Management and Retention Challenges to Implementing Policies	15

References

Agarwal T. (2007). *Strategic human resource management*. Oxford University Press.

Aswathappa K.C. (2005). *Human resource and personnel management*. New Delhi: Tata Mc Graw- Hill Publishing Company Limited.

Hitt M.A., Ireland R.D. and Hos Kisson R.D., *Strategic management – strategy formulation implementation*. Thompson Asia Pvt. Ltd.

Rothevell and Kazavas. (1989). *Strategic a human resource development*. Prentice Hall India

Srinivas R. Kavdula. (2001). *Strategic human resource development*. Tata Mc Graw- Hill Publishing Company Limited.

Thomson and Stickland. (2003). *Strategic management*. Tata Mc Graw- Hill Publishing Company Limited.

Venkatarathnam C.S., Srivastava B. K. *Personal management and human resource*. Tata Mc Graw- Hill Publishing Company Limited.

Wagen F. Cascia (2003). *Managing human resource (6th Ed)*. Tata Mc Graw- Hill Publishing Company Limited.

Course Code	Title	Periods/week	Marks	Credits
PSHSIV105	WORK PLACE SAFETY, HEALTH AND ENVIRONMENT	3	75	3

Objectives

- To formulate suitable emergency plan for the workforce taking into consideration fire, accidents, first aid and other potential issues.
- To introduce to the students the concept of health and safety culture and its components.
- To discuss the importance of positive employee attitude towards health and safety in commercial indicators of cost time

Course Content		Periods
Unit I	<p>Introduction Safety, Health and Environment Management, Occupational Safety, Health and Environmental Safety Management – Principles and Practices, Role of Management in Industrial Safety</p> <p>Planning for Safety Nature, scope and procedure, Range of planning, variety of plans, Strategic planning and tools of implementation</p> <p>Levels of Injury/ Accidents Reported/ Unreported, Near Misses, Accident Reports, Action Taken</p> <p>Accident Investigation and Reporting Internal Investigation, Interpreting Findings, Reporting to Authority, Lost time</p> <p>Organizing for Safety Organizing for Safety, Health and Environment Organization structure, Functions and responsibilities</p>	15
Unit II	<p>Safety Committee Monitoring for Safety, Health and Environment Environment Management System, Occupational Safety Bureau of Indian Standards on Safety and Health ILO and EPA Standards</p> <p>Principles of Accidents Prevention</p> <p>Safety, Health and Environment Training Evaluating needs, Training techniques Devising training programs, Methods and Strategies, Training types, Assessment of training programs provided</p> <p>Competence Building Technique</p>	15
Unit III	<p>Machine Operation and Guarding for Worker Safety Basics of Machine Safeguarding, Principles in machine guarding, Methods of Machine Safeguarding Guard Construction, Ergonomics of machine guarding, Type of guards, their design and selection, Guarding of different types of machinery, Robots Vs. Worker</p> <p>Built-In-Safety Devices, Maintenance And Repairs Of Guards Safety in the use of Machines: Procuring, Fool Proofing Preventive Maintenance Periodic Checks For Safe Operation Associated Hazards and their Prevention</p> <p>Material Handling and Storage of Materials <u>Manual:</u> Manual Handling of loads, Safe use of accessories for manual handling Storage of materials , Layout for safety in manual handling and storage <u>Semi/Fully Automated:</u> Lifting machinery, lifts and hoists, Tri loader Safety in design and construction, operation, inspection and maintenance Safety features, Safety Sensor to prevent collision, Automated Guided Vehicle</p> <p>Plant Design and Layout Common Accidents, Plant layout, design for safety Fire Drill, Marking of aisles space and other locations, Use of colour as an aid, Benefits of good housekeeping. Role of preventive maintenance in safety and health. First Aid Boxes and relevant Medi- Aid Emergency exits/ Clear Path to Assembly Points Eye Washers</p>	15

References

- Sarma, A.M. (2002) 1st Edition. *Industrial health and safety management*. Himalaya Publishing House.
- Anshel, J. (1999). *Visual eErgonomics in the workplace*. London: Taylor and Francis
- Clayton and Clayton, (1986). *Industrial hygiene and toxicology*, Vol. I and III Willey Interscience
- Konz, S., Johnson S, (2000), *Work design (Industrial Ergonomics.: USA: Holcomb Hathway Publishers, Inc.*
- Kroemer, K.H.E. (1997). *Ergonomics Design of Material Handling Systems*. NY: Lewis Publishers.
- Mark, A.F., Kahn J.P. (2010). 5th Edition. *Fundamentals of occupational safety and health*. Government Institutes.
- Oberoi, N.K. (2007). *Environmental management*, Second Edition, Excel Books, New Delhi.
- Steve Thompson, Dan Hopwood. (2006). *The Practical Guide to Zero Harm: How to effectively Manage Safety in the Workplace*.
- Workplace Safety: A guide for small and midsized companies*. John Wiley and Sons. Inc.

Course Code	Title	Periods/week	Marks	Credits
PSHSIV106	ENTREPRENEURSHIP	2	50	2

Objectives

- To develop the core skills and competencies required to be an entrepreneur.
- To develop qualities such as leadership, self-confidence, initiative, facing uncertainties, commitment, creativity, people and team building, integrity and reliability required to be an entrepreneur.
- To help students prepare a Project Report.
- To inculcate appropriate values, attitudes and entrepreneurial discipline.

Course Content		Periods
Unit I	<p>Introduction Definition Concept, knowledge and skills requirement for entrepreneurship development Attributes and Characteristics of successful entrepreneurs Entrepreneur Vs. Entrepreneur, Entrepreneurship Vs. Entrepreneur Role of entrepreneurship in economic development and self employment. Factors impacting emergence of entrepreneurship Managerial vs. Entrepreneurial approach Entrepreneurial Process</p> <p>Business Planning Generating business idea: Sources of new ideas Methods of generating ideas – brainstorming, , Using creative thinking to enhance the success of a new business venture, Creative problem solving, Opportunity recognition Environmental scanning, competitor and industry analysis Feasibility study: Describing the various types of feasibility tests that are used to evaluate new products and services market feasibility Technical/operational feasibility, Financial feasibility</p> <p>Analyzing a potential business location to determine its suitability for a new business venture Using the brainstorming process to generate new ideas Applying feasibility testing to a new business venture with your fellow students</p> <p>Drawing a business plan Conducting a basic patent search Preparing project report Presenting business plan to investors Regulatory requirements that affect businesses Legal issues Intellectual property rights patents Trademark, copy rights Trade secrets Licensing Franchising.</p>	15
Unit II	<p>Finance and Functional plans Finance Planning: Cash budget, working capital, proforma income statement proforma cash flow, proforma balance sheet, Types of pricing strategies that are used to determine the unit selling price of a new product or service Types of financial analysis that are used to evaluate new businesses Performing a break-even analysis of a new business venture The advantages and disadvantages of various types of business structures Developing a basic financing plan for a new business venture Estimating and Financing funds requirement - Schemes offered by various commercial banks and financial institutions like IDBI, ICICI, SIDBI, SFCs Role of Central Government and State Government in promoting Entrepreneurship - Introduction to various incentives, subsidies and grants - Export Oriented Units - Fiscal and Tax concessions available Role of following agencies in the Entrepreneurship Development</p>	15

	District Industries Centers (DIC) Small Industries Service Institute (SISI) Entrepreneurship Development Institute of India (EDII) National Institute of Entrepreneurship & Small Business Development (NIESBUD) National Entrepreneurship Development Board (NEDB) Functional plans Marketing research for the new venture Steps in preparing marketing plan Contingency planning Organizational plan Form of ownership Designing organization structure Job design Manpower planning Marketing plan Entrepreneurship The major components of a business plan Describing how a well-written business plan can contribute to the success of a new business venture Conducting a competitive profile analysis to compare the strengths and weaknesses of your competitors Creating a perceptual map that positions your product and your competitors' products against two competitive criteria Identifying entry barriers for a new business venture and describe methods for overcoming those barriers How entry barriers can be used to prevent competitors from entering your marketplace Why do Entrepreneurs fail - The FOUR Entrepreneurial Pitfalls	
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References

- Dollinger, (2004). *Entrepreneurship*. 4th ed. Pearson,
 Gupta C.B., Srinivasan N. P. *Entrepreneurial development* (1992). New Delhi, Sultan Chand & Sons.
 Gurmeet Naroola (2001). *The Entrepreneurial Connection*. Tata McGraw Hill.
 Kuratko, Donald F., Richard M. Hodgetts, (2001). *Entrepreneurship: A contemporary approach*, Fifth Edition, South-Western. ISBN 0-03-019604-3
 Mishra D.N. *Entrepreneur and entrepreneurship development and planning in India*. Chugh Publication, Allahabad.
 Robert J. Calvin (2004). *Entrepreneurial Management*. , Tata McGraw Hill.
 Vasant Desai (2004). *Dynamics of entrepreneurial development and management*, Himalaya Publishing House.

Magazines/ Journals

- Audhugik Disha Nirdesh (in Hindi)*, Pub. by Centre for Entrepreneurship Development, M.P. (CEDMAP), 60, Jail Road, Jhangerbad, Bhopal-462008.
Entrepreneur, Industry and Self-employment Project, Part-1 and 2(in Hindi), Pub. by Centre for Entrepreneurship Development, M.P. (CEDMAP), 60 Jail Road, Jhangerbad, Bhopal-462008.
Small Scale Industry & Self-Employment Projects Part-1 and 2 (in Hindi), Pub. by Centre for Entrepreneurship Development, M.P. (CEDMAP),60 Jail Road, Jhangerbad Bhopal.

Course Code	Title	Periods/week	Marks	Credits
PSHSIVP101	NEW PRODUCT AND EQUIPMENT DESIGN	2	50	2

Objectives

- To analyze existing product design, created product design and suggest product improvement ideas.
- Effectively communicate the results of project.
- Work collaboratively in a team to successfully complete a designed project.

Course Content	Periods
UNIT I Techniques to translate useful and desirable information into design Stages of design research: Define the plan, Organize data, Interpret the data, Applying research to design Gathering user requirement: Consumers' need and choice, Direct observation method, Task analysis procedure	15
UNIT II Current Product Evaluation: Analyze a report on a current product introduced within the last 5 years and sold by a public company. Analyze and bring back vintage product Manufacturing process presentation Rapid prototyping Testing for quality Design of innovative new products and market analysis User centered design of consumer product Features of successful product development, Task based design Evolution of design ideas, concepts and strategies for specific consumer products (minimum two products) Manufacturing, marketability and Business opportunity (of the products designed by the student) Feed back and evaluation of the designed product Incorporating the suggestions to design	15

References

Deiter G, and Schmidt L., (2008). *Engineering design*. Mc Graw Hill.
 Haller L and Cullen C.D, (2004). *Design secrets: Products*. 2nd Ed, Rockport Publishers, Inc
 Jacob Nielson (1994). *Feasibility design*. Tata Mc Graw- Hill Publishing Company Limited.
 Jensen C.Helsel J.D. and Short D.R. (2008), (7th Edition). *Engineering drawing and design*. Mc Graw Hill
 Waldemer Karwowski, M.M.Soaes, N.A.Stanton (2011), *Human factors and ergonomics in consumer product design: Methods and techniques*, USA: Taylor and Francis (CRC Press).

Course Code	Title	Periods/week	Marks	Credits
PSHSIVP102	HUMAN RESOURCE MANAGEMENT APPLICATIONS	2	50	2

Objectives

- To apply Human Resource skills to complete case studies assignments.
- To appreciate the ethics in evaluation of management practices.
- To enable application of practical concepts and techniques in everyday managerial thinking.

Course Content		Periods
Unit I	Quantitative Approach in Human Resource Management Individual Differences and its measurement Psychological Tests: Scope, Use, Limitations Test Construction Procedures and Scaling Techniques Measurement of Intelligence: Intelligent Test, Creativity and Tests Behavioural Assessment in Personnel Selection Ethical and Social consideration in Testing in Organizations	15
Unit II	Developing A Five Year Plan for the College and HR Plan to Complement Implement the Plan through KPIs across all levels so as to meet College Annual Objectives Comprehensive case study on HRM in a knowledge based organization.: Collection and compilation of the material by the participants under the guidance of the resource person.	15

References

Cushway B, Lodge D.(2001). *Organizational behaviour and design*. Delhi: Kogan Page India Pvt. Ltd.
 Ivanceiwich, J. M. *Human resource management*. Tata McGraw hill Publication Ltd.
 Mathi , R. John Jackson. *Human Resource Management*. Thomson Learning Inc.
 Michael Armstrong, Kogen Page. *A Handbook of human resource practices*.
 Shermom, G. (2004). *Competency based human resource management*. Delhi: Tata McGraw – Hill Publishing Company Ltd.
 Singh, P.N.(1998). *Developing and managing human resource (3rd Edition)*. Mumbai: Suchandra Publications.
 Venkata Ratnam C.S., Srivastava, B.K. *Personnel management and human resource*. Tata McGraw hill Publications Ltd.

Course Code	Title	Periods/week	Marks	Credits
PSHSIVP103	ENTREPRENUERSHIP	2	50	2

Objectives

- To develop qualities such as leadership, self-confidence, initiative, facing uncertainties, commitment, creativity, people and team building, integrity and reliability.
- To help students develop the core skills and competencies required to an entrepreneur.
- To enable students to prepare a Project Report.
- To inculcate the important values, attitudes and entrepreneurial discipline.

Course Content		Periods
Unit I	Project Report Preparation of a Project Report for an enterprise dealing with a specific products/services Study the existing market conditions to calculate the viability of the project. Market assessment for the proposed products/services to ascertain the feasibility factor. Assessment of Working Capital. Calculation of total cost of production and Calculation of break-even point. Determining location of a manufacturing unit. Applying Pricing methods to determine the price of products/services. Applying promotion mix to plan a sales campaign for a product or service. Working out a simple budget for a given task or job.	15
Unit II	Market Survey and Report Writing Objectives, Methods and tools (interviews, questionnaires etc.) to be used to collect information, Analysis of data and information, Interpretation and conclusion Case Study: Focused research on an organization, enterprise, practice, behaviour or person	15

References

Akhouri M. M. P., Mishra S.P., Sengupta R. *Trainer's manual on developing entrepreneurial motivation*. (NIESBUD), NSIC-PATC Campus, Okhla.
 Dollinger, (2004). *Entrepreneurship*. 4th ed. Pearson,
 Gupta C.B., Srinivasan N. P. *Entrepreneurial Development* (1992). New Delhi, Sultan Chand & Sons.
 Gurmeet Naroola (2001). *The entrepreneurial connection*. Tata McGraw Hill.

Kuratko, Donald F., Richard M. Hodgetts, (2001). *Entrepreneurship: A Contemporary Approach*, Fifth Edition, South-Western. ISBN 0-03-019604-3

Mishra D.N. *Entrepreneur and entrepreneurship development and planning in India*. Chugh Publication, Allahabad.

Moharana S., Dash C.R.. *Entrepreneurial development*. Jaipur RBSA Publishers.

Pathak H.N., *Product Selection*. NIESBUD, NSIC-PATC Campus, Okhla.

R.A. Baron, S.A. Shane; *Entrepreneurship*, Thomson, 2004, ISBN 0-324-27356-8

Robert Hirsch, Michael Peters. *Entrepreneurship*. Tata McGraw Hill, 5th Edition.

Robert J. Calvin (2004). *Entrepreneurial management*. , Tata McGraw Hill.

Vasant Desai (2004). *Dynamics of entrepreneurial development and management*, Himalaya Publishing House.

M.Sc. (Home Science)
SEMESTER II
BRANCH IV: COMMUNITY RESOURCE MANAGEMENT
MANAGEMENT & ERGONOMICS

Course Code	Subject	Internal Marks	Semester End Examination	Total Marks	Periods/ Week	Credits
PSHSIV201	Research Methods & Statistics	40	60	100	4	4
PSHSIV202	Operations Management	40	60	100	3	4
PSHSIV203	Work Place Safety, Health and Environment	40	60	100	3	4
PSHSIV204	Human Factors and Ergonomic Research	30	45	75	3	3
PSHSIV205	Anthropometry in Work Place Design	30	45	75	3	3
PSHSIVP201	Human Factors and Ergonomic Research	--	50	50	2	2
PSHSIVP202	Current Trends in Management	--	50	50	2	2
PSHSIVP203	Applied Anthropometry	--	50	50	2	2
	TOTAL			600	22	24

Course Code	Title	Periods/week	Marks	Credits
PSHSIV201	RESEARCH METHODS AND STATISTICS	4	100	4

Objectives

- To help students develop the skills needed in conducting a research in their specialization.
- To promote academic, research and professional ethics in students.
- To introduce students to principles of good scientific writing.
- To enable in students the skills in selecting, computing, interpreting and reporting statistics.

Course Content		Periods
Unit I	Sampling techniques in quantitative research Sampling methods in current use/examples from current research Issues with regard to sampling techniques Research designs in quantitative research: Distinguishing between the following research designs; and, selecting research designs that are congruent with one's research purpose. Longitudinal versus cross-sectional Experimental versus quasi-experimental versus correlational Exploratory versus descriptive versus explanatory	15
Unit II	Qualitative research methods Ideology/worldview of the qualitative researcher Research designs in qualitative research Sampling techniques in qualitative research Data collection methods in qualitative research Data analytic strategies in qualitative research Reporting of results in qualitative research Scientific writing Distinguishing scientific writing from popular and literary writing styles Characteristics/principles of scientific writing Examples of good scientific writing Writing a research proposal Reporting statistical findings in text Ethics In academia In research in general In research with human subjects In research with animal subjects	15
Unit III	Other concepts needed for the use of advanced/inferential statistics Types of distribution: Frequency distribution, Normal distribution, Probability distribution, Sampling distribution Type I and type II errors Central limit theorem Point estimation vs. interval estimation Standard error (and confidence intervals) Parametric and nonparametric methods Using an advanced statistical method (steps in using an advanced statistical method)	15
UNIT IV	To study statistics that allows us to contrast phenomena Univariate chi-square test Bivariate chi-square test t- or z- test for contrasting two independent groups Paired t-test ANOVA To study statistics that allows us to examine relationships between variables Bivariate chi-square test Product-moment correlation coefficient Ethics in the use of statistics (e.g., the importance of test assumptions, the number of statistical tests in a research and levels of significance)	15

References

- Bhattacharyya, G.K. and Johnson, R. A. (1977). *Statistical concepts and methods*. NY: John Wiley.
- Dwiwedi, R. S. (1997). *Research methods in behavioral sciences*. Delhi: Macmillan India.
- Gravetter, F. J. and Waillnau, L. B. (2000). *Statistics for the Behavioral Sciences*. Belmont, CA: Wadsworth/Thomson Learning.
- Kerlinger, F. N. and Lee, H. B. (2000). *Foundations of behavioral research*. Orlando, Florida: Harcourt.
- Leong, F.T.L., and Austin, J. T. (Eds.) (1996). *The Psychology research handbook*. New Delhi: Sage.

Course Code	Title	Periods/week	Marks	Credits
PSHSIV202	OPERATIONS MANAGEMENT	3	100	4

Objectives

- To gain knowledge of manufacturing resources, planning concepts and techniques.
- To be able to comprehend principles of Lean Manufacturing.
- To apply resource planning principles and techniques.
- To analyze operation processes from various perspectives such as efficiency, quality and productivity.
- To learn basic analytical skills and tools in studying operations.

Course Content		Periods
Unit I	Introduction Definition, Role and Objectives Introduction to Concepts: Demand and Take Time Layout and types of Flow Conventional: Job, batch and continuous Flow New: Cellular, Agile Value Added Time/ Non- valuable Time and Debottlenecking Cycle times and Live Balancing/ Time and Motion Studies	15
Unit II	Scheduling sustainability: Product planning, KANBAN Capacity Definition and Capacity Utilization Equipment availability, Quality efficiency, Manpower utilization Value Stream Map Modern Schools of Excellence Total Quality Management, TPM, Lean Management, Six sigma	15
Unit III	Inventory Analysis and Control: Raw Materials, Work in process, Finished goods, Need for inventory, Definitions, Continuous and periodic review policies, Lot sizing techniques, Inventory models, Simulation of inventory systems. Master Production Scheduling: Aggregate planning-graphical, empirical, optimization and parametric. Development of a master production schedule, Manufacturing Resource Planning Enterprise Resource Planning.	15
Unit IV	Lean Production Elements of lean production, MRP Vs JIT, Cycle time, takt time, KANBAN, SMED, OEE, 5S, theory of constraints Agile manufacturing. Supply Chain Management Definition, Global optimization, Delayed differentiation, Downward substitution, Product and process modularity, mass customization.	15

References

- An Introduction to Health and Safety – Health and safety in small businesses.* HSE Books
- Barry S. Levy, David W.H., Sherry L., Rosemary K., 2008. *Occupational and environmental health: Recognizing and preventing disease and injury.*
- Charry, S.W (2005) *Production and operation management- concepts, methods and strategy.*, John Willy and Sons Asia Pvt. Ltd.
- Hughes P., Ed Ferrett (5th Edition). *Introduction to health and safety at work.* London and New York: Taylor and Francis
- Krajewski and Ritzman (2004), *Operation management: strategy and analysis*, New Delhi Prentice Hall of India.
- Lees F.P. (1996). *Loss prevention in process industries*. Butterworths and Co.

Course Code	Title	Periods/week	Marks	Credits
PSHSIV203	WORK PLACE SAFETY, HEALTH AND ENVIRONMENT – II	3	100	4

Objectives

- To be able to analyze Safety Techniques adopted in various Industries.
- To understand the hazards at workplace.
- To recommend safety, inspection and training processes.

Course Content		Periods
Introduction, Peculiarities and Parameters governing the safety, Manufacturing processes, Layout and site planning, Good housekeeping, Signage systems, Structural sounding, Accidents and hazards their causes and effects, Preventive measures, Pollution control measures of the industries.		
Unit I	Textile Industry Construction Industry Automobile Industry	15
Unit II	Information Technology: Small Scale Industries	15
Unit III	Construction Industry Packaging Industries Fisheries	15

References

- '*Encyclopedia of Occupational Health and Safety*'. Vol. I and III (1985). International Labour Office, Geneva.
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 David L. Goetsch and Gene Ozon. (2006). *Occupational health and safety*. Pearson Education Canada Inc. Toronto, Ontario.
Encyclopedia of occupational safety and health (1980) ILO.
 John Redley (1983). *Safety at work*. Butterworth and Co. London.
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Course Code	Title	Periods/week	Marks	Credits
PSHSIV204	HUMAN FACTORS AND ERGONOMIC RESEARCH	3	75	3

Objectives

- To review topics of current interest in occupational ergonomics and human factors research.
- To evaluate occupational ergonomics and human factors methodology and research priorities.
- To gain an understanding of guidelines for displays, controls, anthropometry, office ergonomics, work physiology and manual material handling.
- To understand the benefits and limitation of ergonomics measurement techniques and research methods.

Course Content		Periods
Unit I	Work Methods Key Concepts And Terms, Historic Developments Work Description and Measurements – Flow Process Chart, Stop Watch Studies. Human Factors and Ergonomics Methods Challenges for Human Ergonomics Methods Need for ergonomic Research Ergonomics Injury Statistics Definition Of Hazard And Risk Risk Evaluation and Assessment Systems	15
Unit II	Research Methodology for Human Factors Subjective Ergonomics and Workplace Analysis Interview, Questionnaire, Nordic, Body map, Rating scale, SWAT, Borg 10, Borg 20 NASA-TLX Objective Ergonomics and Workplace Analysis RULA (Rapid Upper Limb Assessment), REBA, OWAS, JSI (Job Stream Index), HAL (Hand Activity Level), Moore Garg Strain Index, OCRA, MAPO, PLIBEL, QEC (Quick Exposure Checklist), NIOSH lifting Equation, Snook Table, Assessment of Mental Work Load	15
Unit III	Visual Sensory System Signal Detection Auditory-Sensory System and Noise Design of Control, Display and Symbols Repetitive Motion Injury and Design Of Hand Tools Ergonomics of Seating and Computer Work Physical Work and Heat Stress Station.	15

References

- Aldrich T.B., Szabo S.M., Bierbaum C.R. (1989). *Application of human performance models to system design*. New York: Plenum Press.
 Alvin R. Tilley, Henry Dreyfuss Associates, (2002). *The measure of man and woman*. New York: John Wiley and Sons, Inc
 Martin H. (2006). *A guide to human factors and ergonomics* (2nd Edition). Taylor and Francis.
 Salvendy G. (2006). *Handbook of human factors and ergonomics* (3rd Edition). Wiley and Sons: New York.
 Sanders M.M., Mc. Cornick R.J. (1993). *Human factors in ergonomics and design* (7th Edition). New York: McGraw – Hill
 Wickens C.D., Lui Y., Becker S.G. (2004). *An introduction to human factors engineering* (2nd Edition). Pearson/Prentice Hall.

Course Code	Title	Periods/week	Marks	Credits
PSHSIV205	ANTHROPOMETRY IN WORK PLACE DESIGN	3	75	3

Objectives

- To identify the strength and weaknesses of workplace and propose needed changes.
- To enable the students to reflect on the information gained and apply it to their lives, homes, workplace and the world around them

Course Content		Periods
Unit I	Introduction Principles of Anthropometry applied to benefit posture and health Displays, Control and Information Task Analysis Designing for Manufacture and Maintenance	15
Unit II	Workplace Layout and Design Application of Ergonomics Principles Tools and Equipment Design Human Machine Systems Input/ Output Technology, Usability; Evaluation; Health Problems Problem Solving; Decision Making Cognitive Ergonomics	15
Unit III	Workplace Design and Assessment Future Systems Job Design Scientific Management Development of Ergonomic Strategy at Work	15

References

- Damon A., Howard W. S. Armstrong R. Mc. Farland, (1966). *Human body in equipment design*. Harvard University Press.
- David W.A., (2009). *Biomechanics and motor control of human movement*. John Wiley and Sons.
- Ernest J.M., Mark S.S. (1981). *Human factors in engineering and design*. Tata McGraw Hill Pub.
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- Miriam P. G. (2001). *Effects of worker anthropometry and workplace design upon shoulder discomfort and task productivity*. University of Massachusetts, Amherst.

Course Code	Title	Periods/week	Marks	Credits
PSHSIVP201	HUMAN FACTORS AND ERGONOMIC RESEARCH	2	50	2

Objectives

- To gain an understanding of Human Strengths and Limitations by analyzing human perception, cognition, memory, attention, biomechanics and motor learning and control.
- To understand the way people process information.
- To enable prediction of Human Machine Interaction and thereby design products and systems to maximize user effectiveness.
- To prepare reports that summarizes findings and recommendations for improvement

Course Content		Periods
Unit I	Subjective Ergonomics and Workplace Analysis Interview, Questionnaire, Nordic, Body map, Rating scale, SWAT, Borg 10, Borg 20, NASA-TLX	15
Unit II	Objective Ergonomics and Workplace Analysis RULA (Rapid Upper Limb Assessment), REBA, OWAS, JSI (Job Stream Index), HAL (Hand Activity Level), Moore Garg Strain Index, OCRA, MAPO, PLIBEL, QEC (Quick Exposure Checklist), NIOSH lifting Equation, Snook Table, Assessment of Mental Work Load	15

References

- Christopher D.W (1992). *Engineering psychology*. Harper Collins Publishers.
- Christopher D.W, Sallie E.G., Yilli Liu (1998). *An introduction to human factors engineering*. Orient Longman.
- Martin H. (2006). *A Guide to Human factors and ergonomics*. CRC Taylor and Francis.
- Staton N, Hedge A, Brook Huis K, Sales E., Hendrik H., (2005) *Handbook of human factors and ergonomics methods*, US: CRC Press.

Course Code	Title	Periods/week	Marks	Credits
PSHSIVP202	CURRENT TRENDS IN MANAGEMENT	2	50	2

Objectives

- To gain knowledge about the recent perspectives in management.
- To familiarize the students with current industry techniques and trends and its applications to managerial decision making.

Course Content		Periods
Unit I	Knowledge Management Concept, Knowledge Management Strategies and Practices Six Sigma: Concept, Steps Involved In Launching Six Sigma, Advantages. Globalizing Business Meaning, Concept & Importance Unified Framework for Global Business Mergers & Acquisitions Concepts & Varieties of Merger Procedures for Mergers & Acquisitions, Different aspects in Mergers & Acquisitions Aspects & Issues in Mergers & Acquisitions Relevance in 21 st Century Businesses: Regulatory Control.	15
Unit II	IT Enabled Services Business Process Outsourcing and Knowledge Process Outsourcing World Class Manufacturing Concept And Importance Lean Manufacturing Practices Just In Time and Theory of Constraints. Corporate Social Responsibility	15

References

Burton, Jene (2001). *Management today: Principles and practice*. Tata Mc-Graw-Hill Publishing Co. Ltd.
 L. M. Prasad (2008). *Management principles and practice*. New Delhi. Himalayas Publishing House.
 Wehrich Heinz, Koontz Harold (1993). *Management: A global perspective*. New Delhi, Tata McGraw-Hill Publication Company.

Course Code	Title	Periods/week	Marks	Credits
PSHSIVP203	APPLIED ANTHROPOMETRY	2	50	2

Objectives

- To be able to generate ergonomics data, interpret and apply it to evolve appropriate systems.

Course Content		Periods
Unit I	Introduction Definition and Key Concepts: Body Volumes, Masses Of Body Segments, Center of Gravity, Inertial Properties. Static Anthropometric Measurements Between Joint Centers, Body Lengths And Contours Measuring Tools: Laser (Computer), Measuring Tape, Calipers Dynamic Anthropometric Measurements Somatography, Scale Model Mock-Up, Envelopes (Work, Walking, Turning, Bending, Boundaries), Graphic Depiction Of Envelopes	15
Unit II	Human Variability Age, Sex, Societal Changes, Daily Changes, Generational Changes, Ethnicity Design Principles For: Extreme Individuals (95 th Percentile), Minimum Population Value (5 th Percentile), Adjustable Range, Designing For The Average, Design For Motion Anthropometric Application For: Children, Aging, Pregnant Women, Health Care Professionals, Medical and Para- Medic Professions, Performing Artists	15

References

Pheasant Stephen (1996), *Bodyspace: Anthropometry, ergonomics and design of work* (2nd Edition), UK : Taylor and Francis Ltd.
 Kroemer K.H.E (2006), “Extra –ordinary” ergonomics, USA: Taylor and Francis (CRC Press)
 Rogers W.A. (1997). *Designing for an aging population: 10 years of human factors/ergonomics research*. Human Factors and Ergonomics Society.
 Kumar., *Biomechanics in ergonomics* 2nd Ed.
 Kroemer K.H.E, Kroemer. H.B. , Kroemer E., (2000). *Ergonomics: How to design for ease and efficiency* (2nd Ed.). Prentice Hall International series in Industrial and System Engineering.

Scheme of Examination

The performance of the learners shall be evaluated into two parts. The learner's performance shall be assessed by Internal Assessment with 40% marks in the first part by conducting the Semester End Examinations with 60% marks in the second part. The allocation of marks for the Internal Assessment and Semester End Examinations are as shown below:-

Internal assessment for Theory 40 % (40 marks)

Sr. No.	Evaluation type	Marks
1	One seminar based on curriculum assessed by teacher of the institution teaching PG learners / Publication of a research paper/ presentation of a research paper in seminar or conference. A. Selection of the topic, introduction, write up, references- 15 marks. B. Presentation with the use of ICT- 15 marks.	30
2	Active participation in routine class instructional deliveries	05
3	Overall conduct as a responsible learner, communication and leadership qualities in organizing related academic activities	05

Internal assessment for Theory 40 % (30 marks)

Sr. No.	Evaluation type	Marks
1	One seminar based on curriculum assessed by teacher of the institution teaching PG learners / Publication of a research paper/ presentation of a research paper in seminar or conference. A. Selection of the topic, introduction, write up, references- 15 marks. B. Presentation with the use of ICT- 15 marks.	20
2	Active participation in routine class instructional deliveries	05
3	Overall conduct as a responsible learner, communication and leadership qualities in organizing related academic activities	05

Semester End Theory Examination 60 %**Semester End Theory Examination of 60 marks (three unit courses)**

Duration: These examinations shall be of two and half hours duration.

Theory question paper pattern:

- There shall be five questions each of 12 marks. On each unit there will be one question and the first one will be based on entire syllabus.
- All questions shall be compulsory with internal choice within the questions. Each question will be of 18 to 20 marks with options.
- Question may be subdivided into sub-questions a, b, c... and the allocation of marks depend on the weightage of the topic.

Semester End Theory Examination of 45 marks (three unit courses)

Duration: These examinations shall be of one and half hours duration.

- There shall be three questions each of 15 marks. On each unit there will be one question.
- All questions shall be compulsory with internal choice within the questions. (Each question will be of 20 to 23 marks with options.)
- Questions may be subdivided into sub-questions a, b, c... and the allocation of marks depend on the weightage of the topic.

Practicals Semester End Examination of 50 marks (No Internal Assessment)

Duration: These examinations to be conducted for three hours.

Sr. No.	Evaluation type	Marks
1	Laboratory work: Semester End Examination	40
2	Journal	05
3	Viva	05

Standard of Passing is as per the ordinances set by the University of Mumbai for the Credit Based Semester and Grading System for the postgraduate courses.