

# SHIVAJI UNIVERSITY, KOLHAPUR



Syllabi of Ph.D./M.Phil. Course Work  
HOME SCIENCE

**A] Ordinance/Rules/Regulations:  
(as applicable to M.Phil./Ph.D. programme)**

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**B] Shivaji University, Kolhapur**

New/Revised Syllabus For Course of M.Phil./Ph.D. programme

**1. TITLE: Subject- Home Science**

Optional/Compulsory under the Faculty of Science

**2. YEAR OF IMPLIMENTATION:** New/Revised Syllabus will be implemented from June 2011 onwards.

**3. PREAMBLE:**

The M.Phil./Ph.D. Course Work shall involve Three Papers Viz.

Compulsary paper-I

i) Research Methodology

Compulsary paper-II

ii) Recent Trends in the Home Science:

iii) Optional paper (Based on Specialization): Any one among five specializations

1. Thrust Areas for Research in Food and Nutrition

2. Thrust Areas for Research in Family Resource Management

3. Thrust Areas for Research in Human Development

4. Thrust Areas for Research in Textile and Clothing

5. Thrust Areas for Research in Home Science Extension Education

**4. DURATION**

\* The M.Phil. programme shall be a full time regular course

\* The duration of M.Phil. programme shall be of One year

**5. PATTERN:**

Pattern of Examination will be Annual in respect of M.Phil./ (including dissertation) Semester in respect of Ph.D.

**6. FEE STRUCTURE:**

(as applicable to regular course)

i. Entrance Examination Fee: i. Open category- 850.00 ii. Reservation- 650.00

(Non-refundable)

ii. Course Fee.

<b>Particulars</b>	<b>Rupees</b>
Tuition fee	3500.00
Laboratory fee	1500.00
Internet fee	1500.00
Library fee	1000.00
Annual Total fee per student	7500.00

#### **7. ELIGIBILITY FOR ADMISSION:**

As per eligibility criteria prescribed for each course and the merit list in the qualifying examination.

#### **8. MEDIUM OF INSTRUCTION:**

The medium of instruction shall be English.

#### **9. STRUCTURE OF THE COURSE WORK FOR M.Phil./Ph.D.**

(NO. OF PAPERS THREE)

<b>SR.No.</b>	<b>Subject/Papers</b>	<b>Marks</b>
1.	Research Methodology	100
2.	Recent Trends in Home Science	100
3.	Optional paper (Based on specialization)	100
	Total	300

**10. SCHEME OF TEACHING AND EXAMINATION:**

Paper No.	Subject/Papers(Hrs/Week)				Examination Schemes (Marks)		
	L	T	P	Total	Theory	Term work/ seminar	Total
1.	3	.....	.....	3	100		100
2.	3	....	....	3	100		100
3.	3	....	1	4	80	20	100

**11. SCHEME OF EXAMINATION:**

- \* The examination shall be conducted at the end of each academic year.
- \* The theory paper shall carry 100 marks.
- \* The evaluation of the performance of the students in theory papers shall be on the basis of annual examination of 100 marks.
- \* Question paper will be set in the view of the /in accordance with the entire syllabus and preferably covering each unit of syllabi.

**12. STANDARD OF PASSING:**

As prescribed under rule and regulation for each degree/programme

**13. NATURE OF QUESTION PAPER/ SCHEME OF MARKING:**

1. The student should attempt any four descriptive type questions among given six questions
2. In the compulsory paper each question carry 25 marks
3. In the optional paper each question carry 20 marks
3. Each units of the paper have 25 marks weightage

**14. EQUIVALANCE IN ACCORDANCE WITH TITLES AND CONTENT OF PAPERS (FOR REVISED SYLLABUS)**

<b>Sr.No.</b>	<b>Title of old papers</b>	<b>Title of new papers</b>
1.	Compulsory papers Research Methodology	Research Methodology
2.	Advanced studies in Home Science	Recent Trends in Home Science
3.	Optional papers: Trust areas i. Thrust areas for research in Food and Nutrition ii. Thrust areas for research in Family Resource Management iii. Thrust areas for research in Human Development iv. Thrust areas for research in Textile and clothing v. Thrust areas for research in Home Science Extension Education	Optional papers: Trust areas i. Thrust Areas for Research in Food and Nutrition ii. Thrust Areas for Research in Family Resource Management iii. Thrust Areas for Research in Human Development iv. Thrust Areas for Research in Textile and Clothing v. Thrust Areas for Research in Home Science Extension Education

**NEW/REVISED SYLLABUS FOR**  
**M.Phil./Ph.D. Course Work**  
**(Introduced from June 2011 onwards)**

**Paper-I**

**Title of paper: Research Methodology**

**Specific objectives,**

To enable Students to

1. Understand meaning, process and importance of research in Home-Science.
2. Select problem tools and methods for conducting research.
3. Interpret data manually as well as on computer.
4. Develop inclination in preparing report as well as project proposals.
5. Understand application of statistics in research.
6. Motivate for the use of computers in Research for Home Science.

**Unit – I**

**15 lectures**  
**(25 marks)**

**Statistical Techniques**

- a) Measures of Central Tendency - Mean, Median and Mode.
- b) Measures of Dispersion - Quartile deviation, standard deviation, and their relative measures.
- c) Correlation : Concept of Correlation, Scatter diagram method, Karl Pearson's correlation coefficient.
- d) Hypothesis Testing - Concept of population, sample, Parameter, Statistic,

Hypothesis, one tailed and two tailed tests. Errors in testing of Hypothesis, Critical Region, Level of significance.

a) Large Sample Tests -

i) Test of population mean.

ii) Test of equality two population means.

iii) Test of equality of two population proportions.

b) Small Sample Test -

i) Chi-square test : Test of independence of Attributes and test of population variance.

ii) Student's 't' Test and 'Z' tests : Test of population mean, equality of two means and test of population ,correlation coefficient.

iii) Analysis of Variance - one way and two-way classification.

## **Unit – II**

**15 lectures**

**(25 marks)**

**Computer Application** - Working with MS-word and Excel, formatting document and text, designing tables and graphs for research purpose. Use of various statistical functions like, average, sum, standard deviation, correlation. Slide preparation for power point presentation.

Probability and Probability distributions - Concept of Probability, Laws of Probability : Normal distribution and related examples.

## **Unit – III**

**15 lectures**

**(25 marks)**

a) Meaning and concept of Research.

b) Importance, characteristics and objectives of. Research.

c) Role of research in different areas of Home-Science.

- d) Qualities of good researcher.
- e) Essential steps in research process.
- f) Meaning, Functions, Types and formulation of Hypothesis.
  - a. Types of research design : Historical, case study, survey, , field studies and experiments, observation, experiments in vivo and invitro, evaluation and action research, organoleptic or sensory evaluation methods. Difference between applied and pure research.
  - b. Pilot studies : Meaning, concept, importance, organization, implementation and analysis of findings.
  - c. Sampling Techniques : Characteristics of good sample concepts of simple Random Sampling, stratified sampling, systematic sampling, cluster sampling, Quota sampling.

#### **Unit – IV**

**15 lectures  
(25 marks)**

- a) Tools of Research - Interview, questionnaire, schedule methods,
- b) Scaling Techniques - Types of Scales - Normal, ordinal interval and ratio, scales, steps in construction of scales, Reliability and validity of scales.
- e) Preparation of project proposals and scientific report writing : Formulation of research topic, Title, Importance, Objectives, Reviews of Literature, ;Variables (Types), Methodology, Time schedule and Budget estimate. Funding agencies for research projects. Process of writing a research article in research journal for the publication.



## **vi. Recommended readings:**

### **a. Basic reading :**

1. Research Methods S. R. Gupta.
2. Hand book of Research Methodology -R. P. Devdas and K. Kulandaivel.

### **b. Advance reading:**

1. Research Methodology C. R. Kothari.
2. Probability Theory and Mathematical Statistics V. K. Rohatgi.
3. Fundamentals of Statistics Vol I and II Goon, Gupta Dasgupta.
4. Fundamentals of Mathematical Statistics S. C. Gupta & V. K. Kapoor.

### **c. Reference Books:**

1. Scientific Report Writing P. O. Ingale.
2. Thesis Writing - Some Guidelines, S. Y. Kulkarni and Vandan. Mohod.
3. Guide to Thesis Writing R. Kamath and S. Udipi.
4. Statistical procedures for agricultural research K. A. Gomez and A. A. Gomez, Willily International, John Willeye sons, 1984.
5. Theory and Analysis of Sample survey Darogasingh.
6. Statistics in Psychology and Education H. E. Garret.
7. Research Methodology R. P. Misra.
8. Statistics by Panse and Sukhatnme

### **NOTE:**

- i. This paper shall be common for each five different groups
  - a. social science/Education/Commerce/Management/Law/ Women studies
  - b. life sciences
  - c. Physical sciences
  - d. Language
  - e. Engineering/Technology/Pharmacy

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**i. Paper-II**

**ii. Title of paper: Recent Trends in Home Science**

**iii. Specific objectives,**

- 1) To understand the advanced aspects in Home-Science.
- 2) To recognise the role of advanced studies in various areas of Home-Science.
- 3) To acquaint with recent advances in the field of Home-Science.

**Unit I :**

**15 lectures**  
**(25 marks)**

- a) Studies of traditional and novel foods in India, value added foods, non nutritive foods.
- b) Processing technology of foods and nutritional implication for cereals, pulses, oilseeds, fruits and vegetables, milk, meat, fish and eggs. Impact of environment on Health and Nutritional status of the community. Food allergy, food safety and security, Food adulteration, Food spoilage, Food distribution system.

**Unit II :****15 lectures  
(25 marks)**

Consumer ergonomics- Application of ergonomics in family environment, people with special needs, design of various work stations, equipments and furniture's finishes. New trends in Interior space designing - Material used in interior, surface treatments for various purposes (walls, ceilings, windows and window treatments, Furniture finishes)

**Unit III :****15 lectures  
(25 marks)**

Problems during different stages of life cycle i.e. childhood, adolescence, adulthood and old age (physical, behavioral, psychological and social)

Early childhood education and care centers : crèches, anganwadi, daycare, play schools, Kinder gartens, schools for special children, child welfare organisations i.e. CRY, UNICEF. Government policies for child welfare, NGO's working for child welfare.

**Unit IV:****15 lectures  
(25 marks)**

New developments in fibre manufacturing in India. i.e. bi component, bioconstituent and special purpose fibres. i.e. heat, water, crease, fire, fungal resistance fibres. Entrepreneurship development in women through Home Science education, policies and programmes for development of women entrepreneurs.

**v. Recommended readings:**

**a. Basic reading :**

1. Essentials of Food and Nutrition by M. Swaminathan, Vol II. The Bangalore printing and publishing co. Ltd. No. 88 Mysore road, Bangalore 560 018.
2. Food Science by Norman N. Potter, Joseph H. Hotchkiss, V Edi. CBS Publisher and Distributors, 4596/1A, 11, Dariaganj, New Delhi - 110 002.
3. Management for Modern Families by Gross Crandell and Knoll.
4. Child Development by J. N. Vyas.
5. Community Development - by Govt. of India.

**b. Advanced reading:**

1. Food, Nutrition and Health by Vijaya Khader Kalyani Publishing House, Ludhiyana.
2. Ergonomics at Work by Osborne David, John Willey and Sons, Chickester, London.
3. Early Childhood Care and Education by V. K. Khurshid Al. Eslam.
4. Foundation of Arts Design. Bhatt P.D., Goenkas.
5. Handbook of Textile Fibres and Man made Fibres by Cook. J. Gorden, Merrow publishing Ltd. England.
6. Entrepreneurship for Women in India by Akhauri M. M. P. 1990, Publishing -

**c. Reference Books:**

1. Ergonomics Design for People at Work. Eastman Kodak Company, Vol. I and II.
2. Ergonomics of the Home, Grandjeans Elienns.

3. Body Space, Antropometry, Ergonomics and the design of the work, Pheasant Stephan.
4. The Art of Interior Design, Bau, Victoriak 1655.
5. Encyclopadia of Interior Design.
6. Handbook of Fibre Science and Technology - by lewin M. and Sello, Stephen V. Vol. II.
7. NESBV, New Delhi.
8. Women and Empowerment : Approaches and Strategies by Sahay, S. Discovery Publishing House New Delhi.
9. Empowerment of Women by Yadav, C. P. Laxmi Sansthan Publishing Anmol New Delhi.

**Journals:**

- i. Asian Journal of Home Science
- ii. Journal of Dairy, Foods and Home Science
- iii. Maharashtra Journal of Extension Education
- iv. Indian Journal of Nutrition and Dietetics
- v. Indian Journal of Pediatrics
- vi. Journal of Research Reach

**NEW/REVISED SYLLABUS FOR  
M.Phil./Ph.D. Course Work  
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**i. Paper-III**

(80 marks for theory exam and 20 marks for presentation of review of published papers in National/International Journal for Ph.D. course work and 10+10 marks seminar and review of papers respectively for M.Phil. course)

**ii. Title of paper: Thrust areas for Research in Food and Nutrition  
(Paper No. I)**

**Unit I :** **10 lectures  
(20 marks)**

Formulation of value added and indigenous foods with its evaluation, its efficacy to the community with special reference to vulnerable groups. Nutrition Education: Types, assessment, application to improve Health and Nutritional status of the society, KAP.

**Unit II :** **10 lectures  
(20 marks)**

Processed Foods, its impact on nutrient content, effects on health, evaluation of storage stability of processed foods, food adulteration act and law, its application to the community health. Assessment of food quality

control, food safety and physico-chemical properties of newly developed varieties of foods, Food analysis methods .

**Unit III:**

**10 lectures  
(20 marks)**

Application and evaluation of special dietary treatment in specific diseases cardiovascular, diabetes mellitus, kidney, gastrointestinal (diarrhoea, constipation), under nutrition, over nutrition, liver disease, HIV/AIDS. Formulation, preparation and evaluation of space foods, foods for sports, enteral and parenteral food formulae, role of antioxidant in promotion of health status.

**Unit IV:**

**10 lectures  
(20 marks)**

Estimation of proteins, fats, vitamins minerals and dietary fibres. Nutrition related enzymes and hormones. Methods for evaluation of nutrient metabolism. Concept of nutrigenomics, GM Foods and nutraceuticals Nutrition role of inborn error of metabolism. Nutrition in cellular management. Ministries in Food and Nutrition, and their policies.

**Basic readings:**

1. The Complete Health Food Guide - By Robert Morse, N.D.
2. Hygiene and Health by Ahmed M.N.

**Advance readings:**

1. Cancer free life of Women by Meenal Kumar and R. Kumar
2. Wellness and Well being by R. Kumar and Meenal Kumar.

3. Prevention of Heart disease and healthy life By R. Kumar and Meenal Kumar.



**Reference Books:**

1. Food and Nutrition by Educational Planning Group Delhi.
2. Health and Food by William H. Hay.
3. Biochemistry by U. Satyanarayan
4. Food Science by Norman N. Potter, Joseph H. Hotchkiss.
5. Food Nutrition and Health by Vijaya Khader
6. Essential of Food and Nutrition by M. Swaminathan.

**Journals**

Journal of Food Science and Technology

Indian Journal of Nutrition and Dietetics

American Journal of Nutrition

British Journal of Nutrition

Journal of Plant Food and Human Nutrition

Journal of cereal technology

**NOTE:**

- i. There should be one seminar presentation- 10 marks
- ii. There should be one seminar with grup discussion and oral presentation on review of published paper in national and international journals on relevant topic-10 mark
- iii. The student should follow the instructions for laboratory safety time to time

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**i. Paper-III**

(80 marks for theory exam and 20 marks for presentation of review of published papers in National/International Journal for Ph.D. course work and 10+10 marks seminar and review of papers respectively for M.Phil. course)

**ii. Title of paper: Trust Areas for Research in Family Resource Management (Paper No. II)**

**Unit I :** **10 lectures**  
**(20 marks)**

Impact of socio-economic environment on family and community.  
Management of eco-system - environmental pollution and community health.

**Unit II :** **10 lectures**  
**(20 marks)**

Consumer issues - Impact of Globalization, Privatisation and industrialization on consumer and consumer goods. Equipment Designing - Effect on work, body posture and safety of equipment.

**Unit III :****10 lectures  
(20 marks)**

Environmental issues - women and environment. Fuel technologies and use of nonconventional energy resources.

**Unit IV:****10 lectures  
(20 marks)**

Manpower management and Auditing of Human Resources. Housing Research - Housing conditions, needs and problems in India. Agencies for housing research and development, methods and techniques. Ministries in Family Resource Management and their policies.

**Basic readings:**

1. Modern Ideal House for India. : Deshpande, R. S.
- 2.. Town and Courtly Planning and Housing. : Ambedkar, V. N. & Modak, N. V

**Advance reading:**

1. Publication of Housing Board.
2. : Non-conventional sources of energy.:Jain, H. C.
- 3.. : The World of Petroleum.: Deshpande, B. G

**Reference Books:**

1. The Emerging consumer. : Chandha R
- 2: A Growing Concept: Seetharaman, P and Seth, M. : consumerism
3. Body space, Anthropometry, ergonomics and the Design of work.  
:Pheasant Stephen

4. The Impact of Environmental Degradation on people. :Vegas, Philip and Meanon, Geeta

5. :Eco-Technology for Pollution Control and Environmental management.  
:Trivedy, R. K. and Arvind Kumar

### **Journals**

- i. Journal of Indian Architect
- ii. Asian Journal of Home Science
- iii. Journal of Dairy, Foods and Home Science

### **NOTE:**

- i. There should be one seminar presentation- 10 marks
- ii. There should be one seminar with group discussion and oral presentation on review of published paper in national and international journals on relevant topic-10 mark
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**i. Paper-III**

(80 marks for theory exam and 20 marks for presentation of review of published papers in National/International Journal for Ph.D. course work and 10+10 marks seminar and review of papers respectively for M.Phil. course)

**ii. Title of paper: Trust Areas for Research in Human Development (Paper No. III)**

**Unit I :** **10 lectures**  
**(20 marks)**

Early Childhood Care and Education - Emerging trends. Development problems and disabilities during childhood and adolescence, Guidance and counseling.

**Unit II :** **10 lectures**  
**(20 marks)**

Gender discrimination and its impact on child development. Child Domestic accidents - causes, consequences and remedies.

**Unit III :** **10 lectures**  
**(20 marks)**

Development Intervention for children with special reference to juvenile delinquency, child labour problems. Family - its role, importance and contribution in child development, family disorganization.

**Unit IV :****10 lectures  
(20 marks)**

Impact of technology on human development. Recent approaches - women studies, family welfare programmes. Related Ministries and policies.

**Basic Readings:**

1. Early Childhood Care and Education S. Khurshid-UL-Islam V. K. Rao
2. Integrated Approach to Human Development An Introduction Dr. Rekha Sapra Vishvabharati Publishers, New Delhi. (2007)

**Advance Readings:**

1. Family Relationship and Child Development R. K. Arora Murlial and sons New Delhi - (2006)
2. Child Development and Disability and Assessment Prachi Kanhai Commonwealth New Delhi (2001)
3. Adolescent Girls - Social Needs and Psycho Social Problems R. K. Choudhary J. M. Choudhary National Publishing House, Jaipur (2008)
4. Human Development Diane F. Papalia Sally Nendkop old, Tata McGraw Hill Publishing Company (2004)
5. Child Development and Family Relationship Dr. Veena Sharma Research Publication Jaipur.
6. Managiyg Childhood Problems- Support, Strategies and Interventions G. Norayana Reddy Suma Narayan Reddy, Kanishka Publishers, Distributrs, New Delhi (2003)

**Reference Books:**

1. Child Development Sarla Grover Printwell Publishers, Jaipur
2. Psychology and Child Development S. R. Sharma, Pointer Publishers
3. Handbook of Research in Early Childhood Development Spodek B.
4. Children in India : Issues in Human Development Dsouza, A. (1979)  
Manohar Publisher
5. Relationship in Marriage and Family Stinnett and Walterd
6. Child Development Dr. J. N. Vyas Medi Norld Press Bikaner (1994)

### **Journals**

- i. Asian journal of Home Science
- ii. Indian Journal of Pediatrics
- iii. Indian Journal of Child Development

### **NOTE:**

- i. There should be one seminar presentation- 10 marks
- ii. There should be one seminar with group discussion and oral presentation on review of published paper in national and international journals in relevant topic-10 mark
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**i. Paper-III**

(80 marks for theory exam and 20 marks for presentation of review of published papers in National/International Journal for Ph.D. course work and 10+10 marks seminar and review of papers respectively for M.Phil. course)

**ii. Title of paper: TrustAreas for Research in Textile and Clothing (Paper No. IV)**

**Unit I :** **10 lectures**  
**(20 marks)**

Eco friendly and bio-degradable textiles Textile conservation - Handloom Weaving and Natural dying and printing.

**Unit II:** **10 lectures**  
**(20 marks)**

Physical and chemical assessment of textile, materials. Textile and garment industries - structure, functions and policies.

**Unit III:** **10 lectures**  
**(20 marks)**

Functional clothing, traditional textiles, clothing and embroideries and its application. Fashion and apparel designing.



**Unit IV:****10 lectures  
(20 marks)**

Computer Aided Textile Designing and Fashion Designing. Value addition, Entrepreneurship development in Textile, Clothing and Fashion designing, Ministry and Policies.

**Basic Readings:**

1. Computer Aided Drafting and Design: Concept and Application : Veisinet, D.D.
2. CAD in Clothing and Textile: Aidrich, W.

**Advance Readings:**

1. Sample Fashion Merchandising, : Stone McGraw Publishing house.
2. National Textile Policy, 2000.
3. Textile Processing and Auxiliaries. : Subhodh Kumar Aggarwal
4. .Weaving Technology: Kulkarni M.M, Vrinda Publication, Jalgaon.
- 5 Handloom weaving Amalsar, D.M.
- 6 Fabric structure and cloth analysis. : Amalsar, D.M.
7. Weaving mechanism, Ahmedabad. : Aswari, K.T.

**Reference Books :**

1. . Textile Testing and Analysis, Billie, J. Colier and Helen H. Epps  
Precice Hall, New Jercey.
2. Principles of Textile Testing, Booth : J.E Newness Butter Worth,  
London.
3. Textile Testing.: John, H. Skinikie
4. Ecology and Textile: Shenai V.A., Sevak Publication.
5. Toxicity of dyes and intermediates: Shenai V.A. :

6. . Azo dyes – Facts and figures: Shenai V.A

**Journals**

- i. Asian Journal of Home Science
- ii. Indian Journal of Textile and Clothing

**NOTE:**

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- ii. There should be one seminar with group discussion and oral presentation on review of published paper in national and international journals in relevant topic-10 mark
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**i. Paper-III**

(80 marks for theory exam and 20 marks for presentation of review of published papers in National/International Journal for Ph.D. course work and 10+10 marks seminar and review of papers respectively for M.Phil. course)

**ii. Title of paper: Trust Areas for Research in Home Science**  
**Extension Education (Paper No. V)**

**Unit I :**

**10 lectures**  
**(20 marks)**

Self Help Group (SHG) and rural development with special reference to social and economic development. Women empowerment through SHG. Local organizations and rural development i.e. Anganwadi, PHC, Panchayat raj system. Co-operative society, Mahila Mandal, Krishi Vikas Kendra. Its participation and Assessment.

**Unit II:**

**10 lectures**  
**(20 marks)**

Evaluation of Extension Education Programmes / Schemes - related to Home Science. Dynamics of communication application in Home Science research. Use of audio-visual aids in communication.

**Unit III :****10 lectures  
(20 marks)**

Government policies, and programmes for development of women entrepreneur. Self employment and Entrepreneurship development through Home Science education. Gender discrimination and its impact on community development.

**Unit IV :****10 lectures  
(20 marks)**

Programmes for rural / community development – Gram Swachnata Abhiyan and Nirmal gram yojana, Kanya Bachav Mohim. Disaster Management - Natural and Manmade calamities, its management.

**Basic Readings:**

1. Textbook of Extension Education Dr. S. V. Supe
2. Extension and Community Development Directorate of Extension Govt. of India, New Delhi

**Advance Readings:**

1. Extension and Rural Development O. P. Dhama
2. Extension Education for Community Development Dhama O.P. and Bhatnagar
3. Extension Communication and Management by Ray.

**Reference Books:**

1. Rural Sociology, Samat
2. Rural Social Organisation, Sandadron.

3. Co. op. Extension work Kelse A Hearue.
4. Extension Education Ranjeet Singh.
5. Hand Book of Extension Education Choube
6. Social Change in Rural Sociology Rogers

### **Journals**

- i. Asian journal of Home Science
- ii. Maharshta Journal of Extension Education
- iii. Asian journal of Extension Education
- iv. Maharshta Journal of Agricultural Research Technology

### **NOTE:**

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- ii. There should be one seminar with grope discussion and oral presentation on review of published paper in national and international journals in relevant topic-10 mark
- iii. The student should followed the instructions for laboratory safety time to time