

# BANASTHALI VIDYAPITH

**Master of Science (Home Science - Human Development)**

**Master of Science (Home Science-Food Science and Nutrition)**

**Master of Science (Home Science - Clothing and Textile)**



## Curriculum Structure

First Semester Examination, December, 2019

Second Semester Examination, April/May, 2020

Third Semester Examination, December, 2020

Fourth Semester Examination, April/May, 2021

**BANASTHALI VIDYAPITH**

**P.O. BANASTHALI VIDYAPITH**

**(Rajasthan)-304022**

**No. F. 9-6/81-U.3**  
**Government of India**  
**Ministry of Education and Culture**  
**(Department of Education)**

New Delhi, the 25th October, 1983

**NOTIFICATION**

In exercise of the powers conferred by Section 3 of the University Grants Commission Act, 1956 (3 of 1956) the Central Government, on the advice of the Commission, hereby declare that Banasthali Vidyapith, P. O. Banasthali Vidyapith, (Rajasthan) shall be deemed to be a University for the purpose of the aforesaid Act.

Sd/-  
**(M. R. Kolhatkar)**  
Joint Secretary of the Government of India

**NOTICE**

Changes in Bye-laws/Syllabi and Books may from time to time be made by amendment or remaking, and a Candidate shall, except in so far as the Vidyapith determines otherwise, comply with any change that applies to years she has not completed at the time of change.

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## **HOME SCIENCE PROGRAMME**

The quality of life of society and the family determines positive functioning. Home Science has a vital role to play in increasing the capacity of the family and the community. At Banasthali Vidyapith, the faculty of Home Science strives to work dedicatedly towards women's empowerment through socially-relevant, holistic, interdisciplinary education, in keeping with its unique philosophy of Panchmukhi Shiksha (Five fold education). Home Science curriculum is offered in a composite form as per the development trends incorporating multi-disciplinary skills, linking the general studies with professional courses integrating theory and practice, and flexibility to the credit based system to meet the challenges in Indian ethos and global context. The curriculum is continually innovated to make it globally valuable, locally relevant and responsive to the changing times and needs. The course sensitizes students to the needs of others, especially of those less advantaged, and fosters a service orientation. The faculty also aims to contribute to the national and international knowledge base in Home Science and allied fields. Due emphasis has always been given to the skill development and enhancement in the students.

The degrees offered by the faculty include B.Sc. (Home Science) and M.Sc. (Home Science) in Food Science and Nutrition, Human Development and Clothing and Textile. PhD is awarded in all the five branches of Home Science. Home Science is also offered as a subject in B. A. programme.

### **Program Educational objectives**

Objectives of the Home Science programme are

- To acquaint students with interdisciplinary nature of Home Science as an integrated body of knowledge, all interwoven to enhance the quality of life, and multidisciplinary nature of subjects dealing with art and science of living
- To provide education through integrated approach of combining theory, practical, and field work emphasizing gender neutral, family focus, region specific and career perspective
- To prepare students to become actively involved in local and regional professional service activities which allow continuous initiative for empowering the individual, family and community
- To inculcate scientific thinking to undertake research projects of national and international recognition and publish multidisciplinary papers

## Programme Outcomes

- **PO1 Knowledge** – Have knowledge and holistic understanding of the core courses related to Home Science including Human Development, Foods and Nutrition, Clothing and Textile, Human Management, Extension Education and Communication; and basic courses associated with discipline of Home Science, including Social Sciences, Biological sciences, Physical sciences, Technology and Management.
- **PO2 Planning Abilities-** Apply skills in designing, implementing, monitoring and evaluating programmes effectively for individuals, family, community, and for vulnerable groups of society.
- **PO3 Problem Analysis-** Solve problems concerning home, family, and society for ensured physical and mental health in the changing socio-economic scenario viz. dietary problems, behavioral problems, clothing problems, social problems by applying scientific methods; through critical thinking, assessing, analyzing, finding appropriate solutions and taking decisions
- **PO4 Modern Tool Usage-** Ability to select and use appropriate methods and procedures; tools and equipments; raw materials and other resources for knowledge, skill enhancement, designing and creation of new products, assessment and evaluation
- **PO5 Leadership Skills-** Apply leadership skills; inspiring, taking responsibility, delegating tasks while working in a team, communicating with other teams, providing guidance to lesser skilled in various settings be it family, industry or institutions or carrying out research projects
- **PO6 Professional Identity-** Take various professional roles in industries, govt./non-govt. organizations, institutes as educators, entrepreneurs, counselors, social workers, consultants, designers, researchers and exhibit competencies & skills
- **PO7 Ethics-** Apply ethical practices while data collection, and conducting experiments; involving human beings as well as animals, delivering professional responsibilities

- **PO8 Communication-** Use soft skills for clear, accurate, unambiguous effective communication using verbal and non-verbal skills at inter / intra personal and professional level
- **PO9 Home Science and Society-** Apply knowledge and competencies developed as graduates to impart knowledge, identify, analyze and address family and societal issues to improve quality of life of individual, family and society as a whole, also covering marginalized and vulnerable groups of society.
- **PO10 Environment and Sustainability-** Critically evaluate impact of household and industrial practices on environment. Appreciate use of sustainable practices for improved physical, emotional, social, psychological environment at micro/macro level
- **PO11 Life-Long Learning–** Ability to reason out, learn and improve oneself in the changing dynamic scenario by strengthening the strength and weakening of weaknesses for sustainable developmental needs, technological changes, career requirements and new avenues.
- **PO12 Project-** Provide opportunity to students to get acquainted with innovative projects and develop skills to plan and undertake intervention projects.

**Program specific Outcomes:****M.Sc. (Home Science) Human Development**

Focus on developing knowledge and competence for:

- Teaching and research in academic and other institutions
- Planning and conducting intervention, guidance and advocacy for empowerment of families and communities
- Supervisory, training and consultancy roles and responsibilities in government and non-government agencies/institutions
- Entrepreneurship in specific areas of human development
- Orientation to the socio-cultural and economic environment for planning, monitoring and evaluation of various programmes for children and families
- Advocacy and policy related roles

**M.Sc. (Home Science) Food Science and Nutrition**

Focus on developing knowledge and competence for:

- Academic and research institutions
- Prepare professional to work with government and non-government organization, hospitals, food service institutes and industry in various capacity
- Planning, Mentoring and evaluation of nutrition and health programmes training and IEC activities of regional and national programmes
- Ensuring food safety and quality for consumers
- Advocacy, consultancy and entrepreneurial ventures

## **M.Sc. (Home Science) Clothing and textile**

Focus on developing knowledge and competence for:

- Related area of educational, commercial and research establishments
- Selection and design of fabrics, apparel and accessories for commercial marketing
- Entrepreneurial management in textiles and clothing enterprises/industry
- Enhance self employment through entrepreneurial skill training
- Intensive and extensive theoretical and experiential learning and training in fusion of traditional and modern



## Curriculum Structure

### Master of Science (Home Science - Human Development)

#### Semester - I

Course Code	Course Name	L	T	P	C*
CS 422	Introduction to Computers	4	0	0	4
CS 422L	Introduction to Computers Lab	0	0	4	2
HSC 403	Advanced Study in Human Development : Conception to Childhood	4	0	0	4
HSC 403L	Advanced Study in Human Development : Conception to Childhood Lab	0	0	4	2
HSC 418	Research Methods in Human Development	4	0	0	4
HSC 424	Techniques of Studying Human Development and Scientific Writing	4	0	0	4
HSC 424L	Techniques of Studying Human Development and Scientific Writing Lab	0	0	4	2
HSC 427	Theories of Human Development	4	0	0	4
<b>Semester Total:</b>		<b>20</b>	<b>0</b>	<b>12</b>	<b>26</b>

#### Semester - II

Course Code	Course Name	L	T	P	C*
HSC 401	Adolescence and Youth	4	0	0	4
HSC 401L	Adolescence and Youth Lab	0	0	2	1
HSC 406	Contemporary Issues and Concerns in Human Development	4	0	0	4
HSC 406L	Contemporary Issues and Concerns in Human Development Lab	0	0	4	2
HSC 407	Early Childhood Care and Education	4	0	0	4
HSC 407L	Early Childhood Care and Education Lab	0	0	4	2
HSC 420	Social Psychology	4	0	0	4
HSC 420L	Social Psychology Lab	0	0	2	1
HSC 423	Statistical Methods in Human Development	4	0	0	4
HSC 428P	Work Experience / Internship	0	0	4	2
<b>Semester Total:</b>		<b>20</b>	<b>0</b>	<b>16</b>	<b>28</b>

#### Semester – III

Course Code	Course Name	L	T	P	C*
HSC 502	Adulthood and Ageing	4	0	0	4
HSC 508	Child in the Family	4	0	0	4
HSC 520	Introduction to Guidance and Counseling	4	0	0	4
HSC 520L	Introduction to Guidance and Counseling Lab	0	0	4	2
	Discipline Elective	4	0	4	6
	Open Elective	4	0	4	6
	Reading Elective - I	0	0	0	2
<b>Semester Total:</b>		<b>20</b>	<b>0</b>	<b>12</b>	<b>28</b>

**Semester - IV**

<b>Course Code</b>	<b>Course Name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C*</b>
HSC 501	Abnormal Psychology	4	0	0	4
HSC 525	Parent and Community Education	4	0	0	4
HSC 525L	Parent and Community Education Lab	0	0	4	2
HSC 528P	Project	0	0	12	6
	Elective Specialization Course 1	4	0	0	4
	Elective Specialization Course 2	4	0	0	4
	Elective Specialization Course 3	0	0	4	2
	Reading Elective - II	0	0	0	2
<b>Semester Total:</b>		<b>16</b>	<b>0</b>	<b>20</b>	<b>28</b>

**List of Discipline Elective**

<b>Course Code</b>	<b>Course Name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C*</b>
HSC 554	Persons with Special Needs	4	0	0	4
HSC 554L	Persons with Special Needs Lab	0	0	4	2
HSC 511	Curriculum for Early Years	4	0	0	4
HSC 511L	Curriculum for Early Years Lab	0	0	4	2
HSC 549	Media Planning and Social Marketing	4	0	0	4
HSC 549L	Media Planning and Social Marketing Lab	0	0	4	2
HSC 555	Planning for Innovative Project and Management	4	0	0	4
HSC 555L	Planning for Innovative Project and Management Lab	0	0	4	2

**List of Elective Specialization Course**

<b>Course Code</b>	<b>Course Name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C*</b>
<b>Specialization I Guidance and Counseling</b>					
HSC 517	Guidance and Coping in Crisis	4	0	0	4
HSC 527	Principles and Procedures in Guidance and Counseling	4	0	0	4
HSC 537L	Practicing Guidance and Counseling Lab	0	0	4	2
<b>Specialization II Early Childhood Education</b>					
HSC 513	ECE Centers Organization, Administration and Management	4	0	0	4
HSC 518	Innovative Programmes and Curriculum Planning for ECE Centers	4	0	0	4
HSC 536L	Management and Innovations in Early Childhood Education Lab	0	0	4	2

### List of Reading Elective

Course Code	Course Name	L	T	P	C*
HSC 556R	Safe and Healthy Environments For Young Children	0	0	0	2
HSC 551R	Nanotechnology in Textile	0	0	0	2
HSC 559R	Textile Conservation	0	0	0	2
HSC 553R	Onconutrition	0	0	0	2
HSC 539R	Colour Science and Instrumentation	0	0	0	2
HSC 546R	Inclusive Education	0	0	0	2
HSC 543R	Food Biotechnology	0	0	0	2
HSC 542R	Ergonomic Applications in Interior Design	0	0	0	2
HSC 545R	Functional Clothing	0	0	0	2
HSC 540R	Content Development and Food Labelling	0	0	0	2
HSC 541R	Emerging Technologies for Personalized Nutrition	0	0	0	2
HSC 557R	Sports Nutrition	0	0	0	2
HSC 430R	Introduction to Nutrigenomics	0	0	0	2
HSC 431R	Novel Technologies for Food Processing and Shelf Life Extension	0	0	0	2
HSC 432R	Science of Clothing Comfort	0	0	0	2

### List of Alternative Online Reading Elective

S. No.	Name of Course	Name of Alternate Course	(Core/ Elective /Reading Elective)	URL
1.	Introduction to Nutrigenomics	Online course in lieu - Nutrigenomics for Disease Prevention and Intervention	Reading Elective	<a href="https://www.nutrigenomics.arizona.edu/home.html">https://www.nutrigenomics.arizona.edu/home.html</a>
2.	Novel Technologies for Food Processing and Shelf Life Extension	Online course in lieu-Novel Technologies For Food Processing And Shelf –Life	Reading Elective	<a href="https://nptel.iitkharagpur.ac.in/">https://nptel IIT, Kharagpur Management</a>
3.	Science of Clothing Comfort	Science course in lieu - Science of Clothing Comfort	Reading Elective	<a href="http://swayam.gov.in">http://swayam.gov.in</a> IIT, Delhi

\* **L - Lecture hrs/week; T - Tutorial hrs/week;**  
**P-Project/Practical/Lab/All other non-classroom academic activities, etc. hrs/week; C - Credit Points of the Course**

Student can opt open (Generic) elective from any discipline of the Vidyapith with prior permission of respective heads and time table permitting.

Every Student shall also opt for:

Five Fold Education: Physical Education I, Physical Education II,  
 Five Fold Education: Aesthetic Education I, Aesthetic Education II,  
 Five Fold Education: Practical Education I, Practical Education II  
 one each semester

## Curriculum Structure

### Master of Science (Home Science-Food Science and Nutrition)

#### Semester – I

Course Code	Course Name	L	T	P	C*
CS 422	Introduction to Computers	4	0	0	4
CS 422L	Introduction to Computers Lab	0	0	4	2
HSC 402	Advanced Food Science	4	0	0	4
HSC 402L	Advanced Food Science Lab	0	0	4	2
HSC 413	Human Physiology	4	0	0	4
HSC 413L	Human Physiology Lab	0	0	2	1
HSC 417	Research Methods in Food Science and Nutrition	4	0	0	4
HSC 419	Scientific Writing and Nutrition Communication	4	0	0	4
HSC 419L	Scientific Writing and Nutrition Communication Lab	0	0	2	1
<b>Semester Total:</b>		<b>20</b>	<b>0</b>	<b>12</b>	<b>26</b>

#### Semester - II

Course Code	Course Name	L	T	P	C*
HSC 405	Biochemistry - I: Biomolecules and Energetics	4	0	0	4
HSC 405L	Biochemistry - I: Biomolecules and Energetics Lab	0	0	4	2
HSC 409	Food Microbiology	4	0	0	4
HSC 409L	Food Microbiology Lab	0	0	2	1
HSC 414	Nutritional Epidemiology Paediatric and Geriatric Nutrition	4	0	0	4
HSC 414L	Nutritional Epidemiology Paediatric and Geriatric Nutrition Lab	0	0	2	1
HSC 415	Problems in Human Nutrition	4	0	0	4
HSC 429L	Problems in Human Nutrition Lab	0	0	4	2
HSC 422	Statistical Methods in Food Science and Nutrition	4	0	0	4
HSC 428P	Work Experience / Internship	0	0	4	2
<b>Semester Total:</b>		<b>20</b>	<b>0</b>	<b>16</b>	<b>28</b>

#### Semester – III

Course Code	Course Name	L	T	P	C*
HSC 506	Applied and Community Nutrition	4	0	0	4
HSC 506L	Applied and Community Nutrition Lab	0	0	2	1
HSC 547	Institutional Food Administration (IFA) and Country and Continental Cuisines	4	0	0	4
HSC 547L	Institutional Food Administration (IFA) and Country and Continental Cuisines Lab	0	0	2	1
HSC 521	Metabolism and Diagnostic Biochemistry	4	0	0	4
HSC 521L	Metabolism and Diagnostic Biochemistry Lab	0	0	4	2
	Discipline Elective	4	0	2	5
	Open Elective	4	0	2	5
	Reading Elective - I	0	0	0	2
<b>Semester Total:</b>		<b>20</b>	<b>0</b>	<b>12</b>	<b>28</b>

Semester - IV						
Course Code		Course Name	L	T	P	C*
HSC	523	Nutrition for Health and Fitness	4	0	0	4
HSC	523L	Nutrition for Health and Fitness Lab	0	0	2	1
HSC	528P	Project	0	0	12	6
HSC	530	Techniques and Instrumentation in Nutrition Research	4	0	0	4
HSC	530L	Techniques and Instrumentation in Nutrition Research Lab	0	0	2	1
		Elective Specialization Course 1	4	0	0	4
		Elective Specialization Course 2	4	0	0	4
		Elective Specialization Course 3	0	0	4	2
		Reading Elective - II	0	0	0	2
Semester Total:			16	0	20	28

### **List of Discipline Elective**

<b>Course Code</b>	<b>Course Name</b>		<b>L</b>	<b>T</b>	<b>P</b>	<b>C*</b>
HSC 505	Advanced Nutrition		4	0	0	4
HSC 505L	Advanced Nutrition Lab		0	0	2	1
HSC 544	Food Standards, Safety and Regulations		4	0	0	4
HSC 544L	Food Standards, Safety and Regulations Lab		0	0	2	1
HSC 524	Nutrition in Diseases and Disorders		4	0	0	4
HSC 524L	Nutrition in Diseases and Disorders Lab		0	0	2	1

### **List of Elective Specialization Course**

Course Code		Course Name	L	T	P	C*
Specialization I Food Processing						
HSC	515	Food Processing and Technology	4	0	0	4
HSC	516	Food Product Development Safety and Quality Control	4	0	0	4
HSC	535L	Food Processing and Quality Assurance Lab	0	0	4	2
Specialization II Therapeutic Nutrition						
HSC	509	Clinical Nutrition and Dietetics	4	0	0	4
HSC	522	Nutrition and Critical Care	4	0	0	4
HSC	538L	Therapeutic Nutrition Lab	0	0	4	2

### List of Reading Elective

Course Code	Course Name	L	T	P	C*
HSC 556R	Safe and Healthy Environments For Young Children	0	0	0	2
HSC 551R	Nanotechnology in Textile	0	0	0	2
HSC 559R	Textile Conservation	0	0	0	2
HSC 553R	Onconutrition	0	0	0	2
HSC 539R	Colour Science and Instrumentation	0	0	0	2
HSC 546R	Inclusive Education	0	0	0	2
HSC 543R	Food Biotechnology	0	0	0	2
HSC 542R	Ergonomic Applications in Interior Design	0	0	0	2
HSC 545R	Functional Clothing	0	0	0	2
HSC 540R	Content Development and Food Labelling	0	0	0	2
HSC 541R	Emerging Technologies for Personalized Nutrition	0	0	0	2
HSC 557R	Sports Nutrition	0	0	0	2
HSC 430R	Introduction to Nutrigenomics	0	0	0	2
HSC 431R	Novel Technologies for Food Processing and Shelf Life Extension	0	0	0	2
HSC 432R	Science of Clothing Comfort	0	0	0	2

### List of Alternative Online Reading Elective

S. No.	Name of Course	Name of Alternate Course	(Core/ Elective /Reading Elective)	URL
1.	Introduction to Nutrigenomics	Online course in lieu - Nutrigenomics for Disease Prevention and Intervention	Reading Elective	<a href="https://www.nutrigenomics.arizona.edu/home.html">https://www.nutrigenomics.arizona.edu/home.html</a>
2.	Novel Technologies for Food Processing and Shelf Life Extension	Online course in lieu - Novel Technologies For Food Processing And Shelf –Life	Reading Elective	<a href="https://nptel IIT, Kharagpur Management">https://nptel IIT, Kharagpur Management</a>
3.	Science of Clothing Comfort	Science course in lieu - Science of Clothing Comfort	Reading Elective	<a href="http://swayam.gov.in IIT, Delhi">http://swayam.gov.in IIT, Delhi</a>

\* **L - Lecture hrs/week; T - Tutorial hrs/week;**  
**P-Project/Practical/Lab/All other non-classroom academic activities, etc. hrs/week; C - Credit Points of the Course**

Student can opt open (Generic) elective from any discipline of the Vidyapith with prior permission of respective heads and time table permitting.

Every Student shall also opt for:

Five Fold Education: Physical Education I, Physical Education II,

Five Fold Education: Aesthetic Education I, Aesthetic Education II,

Five Fold Education: Practical Education I, Practical Education II

one each semester

## Curriculum Structure

### Master of Science (Home Science - Clothing and Textile)

#### Semester – I

Course Code	Course Name	L	T	P	C*
CS 422	Introduction to Computers	4	0	0	4
CS 422L	Introduction to Computers Lab	0	0	4	2
HSC 404	Apparel Pattern Making	4	0	0	4
HSC 404L	Apparel Pattern Making Lab	0	0	4	2
HSC 411	Historic Costume	4	0	0	4
HSC 416	Research Methods in Clothing and Textile	4	0	0	4
HSC 425	Textile Chemistry	4	0	0	4
HSC 425L	Textile Chemistry Lab	0	0	4	2
<b>Semester Total:</b>		<b>20</b>	<b>0</b>	<b>12</b>	<b>26</b>

#### Semester - II

Course Code	Course Name	L	T	P	C*
HSC 408	Fashion Business and Communication	4	0	0	4
HSC 408L	Fashion Business and Communication Lab	0	0	4	2
HSC 410	Garment Production Technology	4	0	0	4
HSC 412	Historic Textiles	4	0	0	4
HSC 412L	Historic Textiles Lab	0	0	4	2
HSC 421	Statistical Methods in Clothing and Textiles	4	0	0	4
HSC 426	Textile Testing	4	0	0	4
HSC 426L	Textile Testing Lab	0	0	4	2
HSC 428P	Work Experience / Internship	0	0	4	2
<b>Semester Total:</b>		<b>20</b>	<b>0</b>	<b>16</b>	<b>28</b>

#### Semester – III

Course Code	Course Name	L	T	P	C*
HSC 504	Advanced Apparel Designing and Construction	2	0	0	2
HSC 504L	Advanced Apparel Designing and Construction Lab	0	0	4	2
HSC 512	Dyeing and Printing	4	0	0	4
HSC 512L	Dyeing and Printing Lab	0	0	8	4
HSC 529	Technical Textiles and Textile Ecology	4	0	0	4
HSC 532	Textile Merchandising	4	0	0	4
	Discipline Elective	4	0	4	6
	Reading Elective - I	0	0	0	2
<b>Semester Total:</b>		<b>18</b>	<b>0</b>	<b>16</b>	<b>28</b>

**Semester - IV**

<b>Course Code</b>	<b>Course Name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C*</b>
HSC 507	CAD in Textile and Garment Designing	2	0	0	2
HSC 507L	CAD in Textile and Garment Designing Lab	0	0	8	4
HSC 510	Commercial Clothing	4	0	0	4
HSC 510L	Commercial Clothing Lab	0	0	8	4
HSC 528P	Project	0	0	12	6
	Open Elective	4	0	4	6
	Reading Elective - II	0	0	0	2
<b>Semester Total:</b>		<b>10</b>	<b>0</b>	<b>32</b>	<b>28</b>

**List of Discipline Elective**

<b>Course Code</b>	<b>Course Name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C*</b>
HSC 514	Fabric Manufacture	4	0	0	4
HSC 514L	Fabric Manufacture Lab	0	0	4	2
HSC 549	Media planning and Social Marketing	4	0	0	4
HSC 549L	Media Planning and Social Marketing Lab	0	0	4	2
HSC 558	Textile auxiliaries and their application	4	0	0	4
HSC 558L	Textile auxiliaries and their application Lab	0	0	4	2
HSC 531	Textile Finishes	4	0	0	4
HSC 531L	Textile Finishes Lab	0	0	4	2
HSC 548	Knitting Technology	4	0	0	4
HSC 548L	Knitting Technology Lab	0	0	4	2



### List of Reading Elective

Course Code	Course Name	L	T	P	C*
HSC 556R	Safe and Healthy Environments For Young Children	0	0	0	2
HSC 551R	Nanotechnology in Textile	0	0	0	2
HSC 559R	Textile Conservation	0	0	0	2
HSC 553R	Onconutrition	0	0	0	2
HSC 539R	Colour Science and Instrumentation	0	0	0	2
HSC 546R	Inclusive Education	0	0	0	2
HSC 543R	Food Biotechnology	0	0	0	2
HSC 542R	Ergonomic Applications in Interior Design	0	0	0	2
HSC 545R	Functional Clothing	0	0	0	2
HSC 540R	Content Development and Food Labelling	0	0	0	2
HSC 541R	Emerging Technologies for Personalized Nutrition	0	0	0	2
HSC 557R	Sports Nutrition	0	0	0	2
HSC 430R	Introduction to Nutrigenomics	0	0	0	2
HSC 431R	Novel Technologies for Food Processing and Shelf Life Extension	0	0	0	2
HSC 432R	Science of Clothing Comfort	0	0	0	2

### List of Alternative Online Reading Elective

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Five Fold Education: Aesthetic Education I, Aesthetic Education II,

Five Fold Education: Practical Education I, Practical Education II

one each semester

## Five Fold Activities

Fine Arts		Physical Education and Sports	
BVFF 101	Classical Dance (Bharatnatyam)	BVFF 201	Aerobics
BVFF 102	Classical Dance (Kathak)	BVFF 202	Archery
BVFF 103	Classical Dance (Manipuri)	BVFF 203	Athletics
BVFF 104	Creative Art	BVFF 204	Badminton
BVFF 105	Folk Dance	BVFF 205	Basketball
BVFF 106	Music-Instrumental (Guitar)	BVFF 206	Cricket
BVFF 107	Music-Instrumental (Orchestra)	BVFF 207	Equestrian
BVFF 108	Music-Instrumental (Sarod)	BVFF 208	Flying - Flight Radio Telephone Operator's Licence (Restricted)
BVFF 109	Music-Instrumental (Sitar)	BVFF 209	Flying - Student Pilot's Licence
BVFF 110	Music-Instrumental (Tabla)	BVFF 229	Aeromodelling
BVFF 111	Music-Instrumental (Violin)	BVFF 210	Football
BVFF 112	Music-Vocal	BVFF 211	Gymnastics
BVFF 113	Theatre	BVFF 212	Handball
		BVFF 213	Hockey
<b>Social Service and Extension Activities</b>		BVFF 214	Judo
BVFF 301	Banasthali Sewa Dal	BVFF 215	Kabaddi
BVFF 302	Extension Programs for Women Empowerment	BVFF 216	Karate – Do
BVFF 303	FM Radio	BVFF 217	Kho-Kho
BVFF 304	Informal Education	BVFF 218	Net Ball
BVFF 305	National Service Scheme	BVFF 219	Rope Mallakhamb
BVFF 306	National Cadet Corps	BVFF 220	Shooting
		BVFF 221	Soft Ball
		BVFF 222	Swimming
		BVFF 223	Table Tennis
		BVFF 224	Tennis
		BVFF 225	Throwball
		BVFF 226	Volleyball
		BVFF 227	Weight Training
		BVFF 228	Yoga

## Evaluation Scheme and Grading System

Continuous Assessment (CA) (Max. Marks)					End-Semester Assessment (ESA) (Max. Marks)	Grand Total (Max. Marks)
Assignment		Periodical Test		Total (CA)		
I	II	I	II			
10	10	10	10			
40					60	100

In all theory, laboratory and other non classroom activities (project, dissertation, seminar, etc.), the Continuous and End-semester assessment will be of 40 and 60 marks respectively. However, for Reading Elective, only End semester exam of 100 marks will be held. Wherever desired, the detailed breakup of continuous assessment marks (40), for project, practical, dissertation, seminar, etc shall be announced by respective departments in respective student handouts.

Based on the cumulative performance in the continuous and end-semester assessments, the grade obtained by the student in each course shall be awarded. The classification of grades is as under:

Letter Grade	Grade Point	Narration
O	10	Outstanding
A+	9	Excellent
A	8	Very Good
B+	7	Good
B	6	Above Average
C+	5	Average
C	4	Below Average
D	3	Marginal
E	2	Exposed
NC	0	Not Cleared

Based on the obtained grades, the Semester Grade Point Average shall be computed as under:

$$SGPA = \frac{CC_1 * GP_1 + CC_2 * GP_2 + CC_3 * GP_3 + \dots + CC_n * GP_n}{CC_1 + CC_2 + CC_3 + \dots + CC_n} = \frac{\sum_{i=1}^n CC_i * GP_i}{\sum_{i=1}^n CC_i}$$

Where n is the number of courses (with letter grading) registered in the semester,  $CC_i$  are the course credits attached to the  $i^{\text{th}}$  course with letter grading and  $GP_i$  is the letter grade point obtained in the  $i^{\text{th}}$  course. The courses which are given Non-Letter Grades are not considered in the calculation of SGPA.

The Cumulative Grade Point Average (CGPA) at the end of each semester shall be computed as under:

$$CGPA = \frac{CC_1 * GP_1 + CC_2 * GP_2 + CC_3 * GP_3 + \dots + CC_n * GP_n}{CC_1 + CC_2 + CC_3 + \dots + CC_n} = \frac{\sum_{i=1}^n CC_i * GP_i}{\sum_{i=1}^n CC_i}$$

Where n is the number of all the courses (with letter grading) that a student has taken up to the previous semester.

Student shall be required to maintain a minimum of 4.00 CGPA at the end of each semester. If a student's CGPA remains below 4.00 in two consecutive semesters, then the student will be placed under probation and the case will be referred to Academic Performance Review Committee (APRC) which will decide the course load of the student for successive semester till the student comes out of the probationary clause.

To clear a course of a degree program, a student should obtain letter grade C and above. However, D/E grade in two/one of the courses throughout the UG/PG degree program respectively shall be deemed to have cleared the respective course(s). The excess of two/one D/E course(s) in UG/PG degree program shall become the backlog course(s) and the student will be required to repeat and clear them in successive semester(s) by obtaining grade C or above.

**After successfully clearing all the courses of the degree program, the student shall be awarded division as per following table.**

Division	CGPA
Distinction	7.50 and above
First Division	6.00 to 7.49
Second Division	5.00 to 5.99
Pass	4.00 to 4.99

**CGPA to % Conversion Formula: % of Marks Obtained = CGPA \* 10**

\* HSC528P Project:

Each student will take Project on a suitable problem related to their respective field of specialization. Project will commence in the second semester and will be completed in the fourth semester. Student will submit project report in triplicate. The evaluation scheme will be as under.

Total Marks: 100

- |     |                                 |   |          |
|-----|---------------------------------|---|----------|
| (1) | *Continuous assessment          | - | 40 marks |
| (2) | **Viva-voce (external)          | - | 30 marks |
| (3) | ***Report-Evaluation (Internal) | - | 30 marks |

\* Continuous assessment will include

- |       |                                      |   |          |
|-------|--------------------------------------|---|----------|
| (i)   | Synopsis presentation in II semester | - | 10 marks |
| (ii)  | Progress seminar in III semester     | - | 10 marks |
| (iii) | Final seminar in IV semester         | - | 10 marks |

(evaluated by all the staff members of specialized course and compiled by HOD)

- |      |                               |   |  |
|------|-------------------------------|---|--|
| (iv) | Progress report by supervisor | - | 10 marks (based on regularity & punctuality of work) |
|------|-------------------------------|---|--|

\*\* Project-viva will be conducted by an external examiner, an internal examiner and vice-chancellor's nominee.

\*\*\* Project report will be evaluated by three member committee chaired by the Head and having two other internal members.

# Human Development

## First Semester

### CS 422 Introduction to Computers

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**4 0 0 4**

#### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Demonstrate knowledge of the computer system
- Have ability to define operating system and Network applications
- Have an understanding of the proper contents of a computer system and these software tools like MS- WORD, MS-EXCEL, MS-PowerPoint and CorelDraw/Adobe Illustrator
- Understand different types of images and their format

#### **Section A**

##### **Introduction to Computers**

Elements of a Computer System, Block diagram of Computer System and functions of its components, evolution of computers and classification, concept of hardware and software. Introduction to Operating Systems (DOS, Windows and UNIX).

#### **Section B**

##### **(a) PC Software**

Word Processing: Creating and Saving documents, formatting, Inserting Tables and Pictures and Mail Merge. Spread sheet: Creating worksheet, Use of functions and Creating Charts. Introduction to Presentation Packages, Graphics and Animation packages.

##### **(b) Introduction to Computing**

Programming languages, system and application software, compiler and interpreters, concept of a program, program design & development, algorithms and flowchart development.

### Section C

#### (a) Internet & Web

Introduction to popular packages on concept of computer communication, computer network (LAN, WAN, MAN), Internet, Internet Services-www, e-mail etc.

#### (b) Introduction to Computer Applications in Home Science

Data Base Management Systems, Statistical Packages, Expert Systems, Multilingual Applications.

#### Suggested Books:

1. Sinha P. K., *Computer Fundamentals: Concepts, Systems and Application*, BPB Publications
2. Rutkosky, S. (2008). *Office 2007*. New Delhi : B.P.B. Publications

#### Suggested E-Resources:

1. Computer Fundamental by P.K. Sinha  
<https://www.edutechlearners.com/computer-fundamentals-p-k-sinha-free-pdf/>
2. Introduction to MS Office  
<https://support.office.com/>

### CS 422L Introduction to Computers Lab

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

L	T	P	C
0	0	4	2

1. Working with Windows
2. Working with MS office Package (MS-Word, Excel, Power Point).
3. Working with CorelDraw
4. Using Internet services
5. Using subject specific application packages

## HSC 403 Advanced Study in Human Development: Conception to Childhood

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

### Learning Outcomes:

On successful completion of the course students will be able to:

- Gain knowledge of various aspects and concerns of development with special focus from conception to middle childhood stages
- Get insight into contemporary issues related to these stages
- State various customs and ceremonies in Indian communities related to prenatal, birth and infant care
- Analyze and effectively deal with developmental and adjustment issues from conception to childhood stages

### Syllabus :

#### Section A

1. History of Human Development
2. Genetic Foundation of Development – Principles of genetics, cross-over and gene – mutation
3. Hereditary diseases/gene linked syndromes
4. Genetic counseling – need, essential qualities of genetic counselor.
5. Assisted reproduction – In vitro fertilization and test tube baby, surrogate mothers – legal & ethical issues
6. Factors causing infertility
7. Recapitulation of stages in prenatal development, genetic and environmental factors

#### Section B

1. Infancy
  - a) Early Infancy :
    - (a) Initial capacities and the process of change
    - (b) The achievements of the first years



- b) Sensory and perceptual development
  - c) Intellectual Development: Piaget's perspective and other recent perspectives
  - d) Emotional and social development and concept of attachment
  - e) Foundation of language development
2. Early childhood
- a) Transition from infancy to childhood
  - b) Social development and development of self concept
  - c) Emotional and moral development
  - d) Process of language acquisition
  - e) Development of cognitive abilities

### **Section C**

1. Middle Childhood
- a) Biological attainments of middle childhood
  - b) Social and emotional development; fear, anxiety and stress
  - c) Intellectual & Cognitive changes
  - d) Development of value system in cultural context
2. Other issues during middle childhood
- a) Health and illnesses during childhood
  - b) Child's sexual abuses
  - c) Impact of media and school
  - d) Development of academic skills
  - e) Changing relationship with parents and new sense of self

### **Reference :**

1. Berk, E.L. (1996). *Child development*. New Delhi: Prentice Hall.
2. Cole, M. & Cole R. Sheila (1996). *The Development of children* (3<sup>rd</sup> ed.) NK: W.H. Freeman and Company.
3. Helen Bee (2000). *Developing Child* (9<sup>th</sup> ed.). Boston: Allyn & Bacon.
4. Santrock, J. W. (1998). *Child Development* (8<sup>th</sup> ed.) NY: McGraw Hill.
5. Stewart, A.C. & Friedman S. (1987) *Child Development, Infancy through Adolescence*. NJ: Wiley International Education.

## **HSC 403L Advanced Study in Human Development: Conception to Childhood Lab**

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

L	T	P	C
0	0	4	2

### **Syllabus :**

1. Collecting information regarding birth related customs and ceremonies in different communities
2. Indian practices during pregnancy
3. Care and adjustments (physical, emotional, psychological) during post partum period
4. Perception of different groups/cultures on Infant care and development
5. Compiling 'Norms' of development for Infants and children.
6. Testing and assessment of Infants:
  - (a) Reflexes (b) Intelligence (c) Attachment (d) Anthropometric measurements
7. Stimulating activities for Infants and children to promote following development -
  - (a) Physical (b) Motor (c) Socio Emotional (d) Language (e) Cognitive
8. Planning leisure time activities for children

## **HSC 418 Research Methods in Human Development**

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

L	T	P	C
4	0	0	4

### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Explain the significance of research methodology in human development
- Distinguish between different types of tools and methods of research
- Analyze a research problem and design research proposals and prepare research report

**Syllabus :****Section A**

1. Research – Meaning, objectives and importance
2. Nature and Areas of research in Home-Science with special reference to Human Development
3. Types of Research
  - a) Basic, Applied and Action research
  - b) Historical research
  - c) Descriptive Research Methods –  
Survey, case study, correlational study, causal comparative.
  - d) Analytic studies – Pre-experimental, experimental and quasi experimental research
4. Qualitative research methods
  1. Theory and design of qualitative research
  2. Definition and types of qualitative methods:
    - a) Informal group discussion
    - b) Interview : Key informant, indepth study
    - c) Observation
    - d) Social mapping
    - e) Participatory Rapid Assessment
    - f) Participatory Learning Assessment
    - g) Case study

**Section B**

1. Definition and Identification of research problem – selection, justification, sources, basic assumptions, limitation and delimitations of the problems.
2. Review of literature: Importance, sources of literature collection and presentation
3. Variables & their types
4. Objectives and assumptions
5. Hypothesis – meaning, importance and ways of stating hypothesis
6. Sampling – meaning, importance, sampling techniques, sources of bias and methods of reducing bias
7. Basic principles of Research Design
  - a) Purpose of Research design
  - b) Design for different types of research

### Section C

1. Sources of primary and secondary data collection
2. Psychometrics : Meaning, characteristics of a good test, determination of reliability, validity, discrimination power
3. Data Analysis: classification, coding and analysis, interpretation of data
4. Research Report :-
  - a) General structure of reporting
  - b) Formal style of writing
    - Acknowledgements
    - Tables & Figures
    - Footnotes, Quotations
    - Appendices, Bibliography

### References :

1. Agarwal, J.C (1966). *Educational Research. An Introduction*. New Delhi : Arya Book Depot.
2. Banclarkar, P.L. and Wilkinson, T.S. (2000). *Methodology and Techniques of Social Research*. Mumbai: Himalaya Publishing House.
3. Best, J.W. (1977). *Research in Education*. New Delhi: Prentice Hall of India.
4. Bhatnagar, G.L. (1990). *Research Methods and measurement in Behavioural and Social Sciences*, New Delhi Agri: Coll Publishing Academy.
5. Chandra, S.S. & Sharma, R.K. (2004). *Research in Education*. New Delhi : Atlantis Publishers.
6. Kaul, Lokesh (2006). *Research in Education and Psychology*. New Delhi: Vikas Publishers.
7. Nachman's, D. & Chava, N. (2008). *Research methods in Social Sciences* (2nd Ed.). New Delhi: St Martin's Press.

### E-Resources:

- Research methodology, methods and techniques, CR Kothari  
<http://www.modares.ac.ir/uploads/Agr.Oth.Lib.17.pdf>
- Research hypothesis – Slide share  
<https://www.slideshare.net/drjayeshpatidar/research-hypothesis-20719840>

## HSC 424 Techniques of Studying Human Development and Scientific Writing

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

### Learning Outcomes:

On successful completion of the course students will be able to:

- Appraise various methods and techniques of studying and researching in human development
- Prepare, implement and evaluate tools appropriate in context of the Human Development discipline
- Write correct in text citations and complete references in approved style(s)
- Communicate effectively with a range of audiences
- Get proficiency in scientific writing for different types of publication

### Syllabus:

#### Section A

1. Human Development study: Time span approach – longitudinal, cross sectional and sequential approach, ethnographical approach, life span approach – Birth to old age
2. Methods of Studying Growth and Body Size– Significance of Anthropometric measurements – Height, Weight, Mid upper arm circumference, Skin fold thickness, Head and Chest circumference, Waist and Hip circumference
3. Psychological Test –ways of constructing a good psychological test and steps for standardization, limitations and ethical considerations in testing
4. Personality Assessment – Purpose and developmental procedures, Projective Techniques – importance and limitations
5. Planning and execution of symposium, seminars, workshops and panel discussion

#### Section B

1. Different tools to measure human attributes: importance, construction and administration, advantages and disadvantages - Observation schedule, Interview, Questionnaire, Case history

2. Scaling Techniques and construction: (The summated Rating, The Likert- type scale, The Thurstone Equal-Appearing Interval Scale, Guttman Scaling, The Semantic Differential Technique, The Bogardus Social Distance Scale )
3. Assessment of Attitudes – Types and uses (Batteries and specific subject test, attitudes of various persons towards various social issues)
4. Measurement of Social Development – Sociometric method and sociogram
5. Emotional intelligence and competencies – Uses and limitations

### **Section C**

1. Scientific writing as a means of communication:
  - Important points in scientific writing (brevity and precision in writing, drafting and redrafting based on critical evaluation)
  - Writing for : Articles in journals, Research notes and reports, Review articles, Monographs, Dissertation, Bibliographies, Book chapter and articles, Book review
2. Outlining a research proposal (Introduction, review of literature, significance of study, operational definition of terms and concepts, delimitations of study, basic assumptions/hypothesis, sampling, tool and procedure of collecting data, analysis technique, references)
3. Writing for Grants:
  - Writing proposal (empirical and theoretical framework presenting pilot study/ background information, time frame budgeting, available infra-structure and resources, appraisal feedback and follow-up procedure)
  - Presentation of report and executive summary
4. Preparing C.V., facing interview and group discussion

### **References :**

1. Aylward, G. (1994). *Practitioner's Guide to Development and Psychological Testing*. New York: Plenum Press.
2. Bamji, M.S. Rao, P.N. & Reddy, V. (Ed.). (1996). *Textbook of Human Nutrition*. New Delhi: Oxford and IBH Publishing CO. Pvt. Ltd.
3. Berk, L.E. (2006). *Child Development*. New Delhi: Prentice Hall.
4. Glatthorn, A.A. & Joyner, R.L. (2005). *Writing the Winning Thesis or Dissertation: A Step by Step Guide* (2nd ed.). California: Corwin Press.

5. Hayes, N. (Ed.) (1997). *Doing Qualitative Analysis in Psychology*. Hove: Psychology Press.
6. Loke, I.F., Spirduso, W.W. & Silverman, S.J. (2007). *Proposals that Work: A Guide for Planning Dissertation & Grant Proposals* (5th ed.). New Delhi: Sage Publication.
7. Santrock, J.W. (1998). *Child Development* (8th ed). New York: Mc.Graw Hill.
8. Saraswathi, T.S. & Kaur, B. (1993). *Human Development and Family Studies in India*. New Delhi: Sage Publications.

#### **E-Resources:**

- शैक्षिक मूल्यांकन 14MB  
<https://drive.google.com/open?id=0Bwk5FIsI0ctxb2lRelA1Mk5za>
- Social Research Methods 5MB  
<https://drive.google.com/open?id=0Bwk5FIsI0ctxQk5yOWpXdUI>

### **HSC 424L Techniques of Studying Human Development and Scientific Writing Lab**

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

#### **Syllabus :**

- 1) Construction of different tools of assessment -
  - (i) Observation Schedule
  - (ii) Interview Schedule
  - (iii) Questionnaire
  - (iv) Rating scale
  - (v) Check list
  - (vi) Sociometry and sociogram
  - (vii) Case study Manual
- 2) To review articles from journals, magazines, news papers, chapter from books
- 3) Preparation of thesis abstracts
- 4) Writing articles for journals, magazines, news papers, books and monographs
- 5) Outlining a research proposal

## HSC 427 Theories of Human Development

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**4 0 0 4**

### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Describe a theory, need for theory, different perspectives and approaches
- Equipped with knowledge regarding general issues of different theories and their classification
- Design practical applications of different theories
- Critically analyze theories in relation to various aspects of human development

### **Syllabus :**

#### **Section A**

1. Theory : Meaning, Definition, Importance of theory.
2. Brief Introduction to different perspectives and approaches of personality
3. Psychoanalytic theory of Sigmund Freud
4. Psychoanalysis and Neo Freudians
  - (a) Carl Gustav Jung – Analytical Psychology
  - (b) Alfred Adler – Individual Psychology
  - (c) Psycho – Social theory of Erick H. Erickson

#### **Section B**

1. Research Oriented theory of personality –
  - (a) Gordon W. Allport - Trait theory
  - (b) Henry H. Murray – Need theory
2. Humanistic and Existential psychology
  - (a) Carl R. Rogers – self actualization theory
  - (b) Abraham Maslow - self actualization theory
  - (c) Curt Lewin - Field theory



### Section C

1. Learning theories -
  - (a) Pavlov - Classical conditioning
  - (b) B.F. Skinner - Operant Conditioning
  - (c) Bandura – Observation Learning
2. Cognitive and Moral development
  - (a) Jean Piaget – Theory of cognitive development
  - (b) Vygotsky - Socio cultural perspective
  - (c) Bruner – Cognitive psychology, Kohlberg -theory of moral development

### References :

1. Allen, B.P. (2000). *Personality Theories Development Growth and Diversity* (3rd ed.). Boston: Ally & Bacon.
2. Baldwin, A.L. (1967). *Theories of Child Development*. New York: Willey & Sons.
3. Bigge M.L. (2003). *Learning Theories for Teachers*. New York: Harper & Row Publishers.
4. Bischof, L.J. (1970). *Interpreting Personality Theories*. New York: Harper and Row Publishers.
5. Ewen, R. & Ewen, R.B. (2014). *An Introduction to Theories of Personality (4th ed.)*. New Jersey: Lawrence Erlbaum Associates Publishers.
6. Hjellev, L.A. & Ziegler D.J. (1992). *Personality Theories: Basic Assumptions, Research and Application*. Auckland: McGraw Hill, International Book Company.
7. Hilgard, E. R. & Bower, G. H. (1966). *Theories of learning*. NJ: Englewood Cliffs.
8. Phares, E.J. (2009). *Introduction to Personality*, Boston: Scott Foresman and Company.
9. Tarry, R.M. (1997). *Contemporary Learning Theories and Research (vol.1)*, New York: Mc Graw Hill.

## Second Semester

### HSC 401 Adolescence and Youth

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

#### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Explain different developmental aspects and characteristic features of adolescence
- Get better insight into the specific issues, concerns and problems of adolescents
- Plan and design effective programs to help youths in difficult circumstances

#### **Syllabus :**

##### **Section A**

Understanding Adolescents behaviour and Development

1. Introduction to adolescence - Different views
2. Transition from childhood to sexual maturity and psychological impact of transitional events
3. Physical and sexual development – Puberty, development of primary and secondary sex characteristics, Gender differences, sexuality and sex education
4. Cognitive development – Formal operational stage of Piaget's theory and Information processing approach
5. Moral development - Kholberg's references
6. Social and emotional development : Interpersonal relation, influences of family & peers, conflict with authority and emotional competence

##### **Section B**

1. Development of the self-different perspectives, construct of self and identity formation
2. Development of self concept & self esteem.- Impact of family, peer group, school & culture on the development of self
3. Approaches to self enquiry, role of childhood experiences and memories

4. Self enhancement techniques
5. Indian views on adolescents identity

### Section – C

Adolescents & Youth at risk -

1. Vocational aspiration & opportunities, education & career problems
2. Problem issues - Infatuation, Sex, marriage
3. Health issues during adolescence
4. Deviant sexual behaviours and STD's
5. Fantasies and obsession, depression, suicide, delinquency, violence & aggression, drug abuse
6. Stress & Strains
7. Helping youth: Prevention, intervention, rehabilitation and environmental consideration

### References:

1. Balk, D. E. (1995). *Adolescence Development*. New York, N.Y: Brooks/Cole.
2. Cobb, N. (1998). *Adolescence: continuity, change and diversity*. Houston: Mayfield publishing.
3. Ingersoll, G. M. (1989). *Adolescents* (2<sup>nd</sup>ed.) Englewood Cliffs N.J: Prentice Hall.
4. Sharma, N. (1999). *Understanding adolescence*. New Delhi: National Book Trust.

## HSC 401L Adolescence and Youth Lab

**Max. Marks : 100**  
(CA: 40 + ESA: 60)

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>

### Syllabus :

1. Identifying contemporary problems of adolescents
2. Plan Programmes for identified problems of adolescents
3. Preparing materials for creating awareness in adolescents for managing their problems
4. Identification of problems of adolescents & youth; written/oral presentation / role play of solutions of any three problems:

- Behavioural changes
  - Sexuality
  - Gender differences
  - Pubertal changes
  - Personality disorders/problems
  - Fantasies
  - Obsessions
  - Depression
  - Suicides
  - Delinquency
5. Planning workshops for adolescents and youth on:
- Vocational aspirations and opportunities
  - Academic problems
  - Career problems
  - Health issue
  - Sex education
  - Deviant sexual behavior
  - STD'S and HIV

## **HSC 406 Contemporary Issues and Concerns in Human Development**

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Explain the current trends, issues related to various aspects of human development
- Interpret the research trends related to various issues and aspects of human development
- Identify and reason out contemporary burning issues affecting family
- Summarize the role of advocacy in promoting issues and concerns related to human development

**Syllabus :****Section A**

1. Issues in the studies of Human Development
  - a) Cultural variation
  - b) Ethical issues
  - c) Role of culture : Cultural transmission and intergenerational relations
  - d) Cultural differences in parental style
  - e) Demographical statistics. Birth and neonate, infancy, early childhood year, adolescence, old age, exceptional children

**Section B**

2. Research Trends
  - a) Current research & trends of last five years: infancy, early childhood years, late childhood, adolescence, adulthood and old age
  - b) Gender issues

**Section C**

3. Contemporary burning issues affecting family
  - a) Rising divorce rates
  - b) Rising age of marriage and its consequences
  - c) Remarriage
  - d) Harassment at work place
  - e) LGBT Rights
  - f) Gender Identity

**Reference :** Students are expected to refer latest books, current journals, magazines reports and surf websites

## **HSC 406L Contemporary Issues and Concerns in Human Development Lab**

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

### **Syllabus:**

Since, the students are expected to get acquainted with various contemporary issues of the society, practicals related to collection of literature, preparation of monographs, writing articles, planning strategies for reduction or alleviation of problems of burning issues will be conducted.

## **HSC 407 Early Childhood Care and Education**

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Describe historical development, aims and principles of early childhood care and education
- Discuss social issues and need for involvement of parents in ECCE
- Identify types of services available related to early childhood care and education in other countries and in India
- Plan programmes, design materials and activities for normal as well as special need early childhood children
- Implement programmes in mock situations and evaluate them

### **Syllabus :**

#### **Section A**

1. Early child care and education: Nature, needs, aims and objectives
2. Brief historical background- John Lock, Rousseau, Pestalozzi, Froebel, Maria Montessori, John Dewey, Lev Vygotsky, Rabindranath Tagore, Gandhiji, Giju bhai & Tarabai Modak

3. Current Issues in early childhood education - popularity, public interest, families & ECE readiness, terminology of ECE
4. Views about children: Miniature adults, the competent child, child as a sinful, blank tablet, growing plant, property investment in future, children as person with rights, children as potential persons
5. Contemporary social issues – working parents, rising incomes, single parents families
6. Paradigm shift in ECE: family centered

### **Section B**

1. Child care: Meeting the needs of parents & children
2. Types of child care: Full service, child care family and relatives, family day care, before & after school care, Head start programme, latchkey children
3. Characteristics of quality child care programme –
  - a) Child related characteristic
  - b) Provider related characteristic
  - c) Facility related
4. Qualities and characteristics of ECE professionals
5. Parent involvement in ECCE: Meaning approach, methods and problem

### **Section C**

1. Play –Types, Importance, play as teaching strategy, Play and creativity, play and disadvantaged, socio – dramatic play, play therapy
  - a) Indoor & outdoor, play, block play, water play, puzzles, sand toys
2. Routine and scheduled activities for ECC - goals, significance, objectives, teacher's role related to-
  - a) Personal skills - health hygiene, Nutrition & food
  - b) Socio-emotional skill – Myself and other people, mannerism
  - c) Sensory experiences – Smell, taste, texture, touch, sound and pitch
3. Planning activity areas

### **Reference Books:**

1. Brewer, J.A. (1998). *Introduction to Early Childhood Education* (3rd ed.). Boston: Allyn & Bacon.

2. Grewal, J.S. (1984). *Early Childhood Education*. New York, NY: Macmillan.
3. Hildebrand, V. (1985). *Guiding Young Children*. New York, NY: Macmillan.
4. Kaul, V. (1997). *Early Childhood Education Programme*. New Delhi: NCERT.
5. Morrison, G.S. (1988). *Education and Development of Infants, Toddlers and Preschoolers*. United States, US: Scott Foresman & Co.
6. Morrison, G.S. (2018). *Early Childhood Education Today* (14th ed.). United Kingdom, UK: Pearson.
7. Pankajam, G. (1994). *Preschool Education*. Ambala: Indian Pub.

### **E-Resources:**

- पाश्चात्य शैक्षिक विचार व विचारक 4MB  
<https://drive.google.com/open?id=0Bwk5FIIsI0ctxQmJYQXJhVkJYW>
- अध्यापन—अधिगम तथा मूल्यांकन 2MB  
<https://drive.google.com/open?id=0Bwk5FIIsI0ctxSlg1d2RoaFRzYjg>
- पाठ्यचर्या तथा अनुदेश 17MB  
<https://drive.google.com/open?id=0Bwk5FIIsI0ctxejNMUFZxbTl6MGc>
- अधिगम के लिए मार्गदर्शन 6MB  
<https://drive.google.com/open?id=0Bwk5FIIsI0ctxRXNHR011T3JWaF>
- Early childhood development and cognitive development  
<https://www.pdfdrive.com/early-childhood-development-and-cognitive-development-e63805631.html>
- Early childhood development and cognitive development in developing countries  
<https://www.pdfdrive.com/early-childhood-development-and-cognitive-development-in-developing-countries-e124334421.html>



## HSC 407L Early Childhood Care and Education Lab

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

L	T	P	C
0	0	4	2

### Syllabus:

1. Visits of various centers (day care centre, Balwadi, Anganwadi)
2. Preparing a resource unit file on the basis of play way method
3. Preparing teaching material kit and presentation in mock set up
  - a) Story
  - b) Types of puppets
  - c) Art and craft portfolio
  - d) Song booklet and low cost musical instruments
  - e) Readiness games and material
  - f) Picture talk object talk
4. Preparing a programme of activities for children with special abilities
5. Planning and executing activities in ECCE Centre
6. Role plays of home visit and conducting a home visit
7. Planning and conducting a parent teacher meeting

## HSC 420 Social Psychology

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

L	T	P	C
4	0	0	4

### Learning Outcomes:

On successful completion of the course students will be able to:

- Understand basics of social psychology and their applications
- Identify powerful sources that influence behaviors of human beings in social situations
- Analyze, design and implement programmes and services with reference to psycho social aspect of human development
- Plan group discussions on various social issue of human behavior

**Syllabus :****Section A**

1. An introduction to social psychology
  - a) Definition, major characteristics and salient features
  - b) Historical perspectives of social psychology – social learning, phenomenological, social cognitive and evolutionary perspective
  - c) Areas of application of social psychology
2. Social psychology of physical and mental health:
  - a) Differences between mental and physical health
  - b) Physical health and habits and lifestyles reaction to illness
  - c) Importance of sensitizing and involving parents and school personnel in mental health aspect of children
3. Stress
  - a) Nature and types
  - b) Factor influencing and responding to stress
  - c) Potential effects of stress
  - d) Tolerance, stress and immune functioning
4. Social psychology of aggression
  - a) Cross cultural context of aggression, causes and control of aggression
  - b) Conflict and violence at work and among teenagers
  - c) Tools and factors for conflict management

**Section B**

1. Social thinking and social influence:  
Forming impression of others, problems of prejudice, power of persuasion, power of social pressure, meaning of adjustment and social adjustment
2. Interpersonal communication process, nonverbal communication toward more effective communication, communication patterns, interpersonal conflict
3. Interpersonal aspects of the legal system- eyewitness, testimony, effect of attorneys, judge, jurors and defendants
4. Social psychology of technology

- a) Technology and the individual – technological fix, techno phobia, techno-stress, acceptance and adoption of technology.
  - b) Technology and health – dissemination of health information, telemedicine
5. Social psychology of consumer behaviours
- a) Advertising
  - b) Persuasion
  - c) Effects of television on consumer behaviour
  - d) New perspectives in consumer behaviour research,
  - e) Social marketing and cause related marketing
  - f) E-commerce
  - g) Web advertising

### **Section C**

1. Social psychology of education
  - a) Socialization in the school
  - b) The teacher's attitude and behaviour
  - c) Social learning in the school
  - d) Importance of academic achievement and failure
  - e) Violence in the school
  - f) Homosexuality – causes and consequences
2. Social Psychology of special education
  - a) Inclusive education
  - b) Socio psychological implications of E-learning
3. Improving academic performance
  - a) Developing sound study habits
  - b) Improving reading
  - c) Getting more out of lectures
  - d) Applying memory principles

### **References:**

1. Albrecht S.L., Chatwick B.A & Jacobson C.K. (1987). *Social Psychology* NJ: Prentice Hall
2. Baron, R.A. & Byrne, D. (2003). *Social Psychology* (10th ed.). New Delhi: Pearson Prentice Hall.

3. Kapoor, M. (1995). *Mental Health of Indian Children*. New Delhi: SAGE Pub.
4. Kool, V.K. (2006). *Applied Social Psychology*. New Delhi: Pearson Prentice Hall.
5. Muchinsky & Wadsworth, T. (2004). *Psychology Applied to Work* (8th ed.). New York: Wadsworth Publisher.
6. Segall, H.W., Berry, S.W. & Postiga, Y.N. (1999). *Human Behavior in Global Perspective: An Introduction to Cross Culture Psychology* (2nd ed.). New York: Pergamon.
7. Sherif M. & Sherif C.W. (1969). *Social Psychology*. NY: Harper & Row Publisher.
8. Weiten, W. & Llyoed, M.A. (2006). *Psychology Applied to Modern Life: Adjustment in the 21<sup>st</sup> Century*. (6th ed.). Australia: Thomson/Wardsworth.

#### **E-Resources :**

- अधिगम के लिए मार्गदर्शन 6MB  
<https://drive.google.com/open?id=0Bwk5FIsI0ctxRXNHR011T3JWaFU>
- Advanced Social Psychology 1MB  
<https://drive.google.com/open?id=0Bwk5FIsI0ctxWjIDaEVKUUIJHSDg>
- General Psychology 6MB  
<https://drive.google.com/open?id=0Bwk5FIsI0ctxYVRTYk5leEtUazA>
- School Psychology 1MB  
<https://drive.google.com/open?id=0Bwk5FIsI0ctxNnN3OWwxWDNjZUU>
- Social Psychology 24MB  
<https://drive.google.com/open?id=0Bwk5FIsI0ctxeTdMaWN0eVBIVjg>
- Social Psychology KB  
<https://drive.google.com/open?id=0Bwk5FIsI0ctxWjNCNTVEbENjZ2s>
- Teacher and School 14MB  
<https://drive.google.com/open?id=0Bwk5FIsI0ctxSHhTTnRGEXZIVkE>

## HSC 420L Social Psychology Lab

**Max. Marks : 100**

**L T P C**

**(CA: 40 + ESA: 60)**

**0 0 2 1**

### **Syllabus :**

1. Case studies of persons / organizations with particular reference to psycho- social environment
2. Survey of support services available for specific psycho social problem
3. Design a mental health intervention programme on any one age group
4. Conducting group conversation on:
  - Stress
  - Violence and aggression
  - Drug abuse
  - Use of different media
  - Eating disorders
  - Advertisement influences
  - Social pressure
5. Preparing action plan on any one psycho social problem
6. Role plays and street plays to discuss and understand :
  - Laws and ethics
  - Inclusive education
  - Subjective wellbeing
  - Improving academic performance
  - HIV / AIDS and other chronic diseases

## HSC 423 Statistical Methods in Human Development

**Max. Marks : 100**

**L T P C**

**(CA: 40 + ESA: 60)**

**4 0 0 4**

### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Discuss the significance of statistics in the discipline of Human Development
- Describe basic concepts of statistical inferences and test of significance
- Apply the appropriate statistical technique for analysis and interpretation of data

**Syllabus :****Section A**

1. Statistics: Meaning, importance, scales of measurement, conceptual understanding of appropriate statistical methods, and limitations of statistics techniques
2. Role of Statistics in Human Development discipline  
Classification and tabulation of data, discrete and continuous variables, diagrammatic presentation of data  
Frequency distribution, Histogram, frequency Polygon and Ogive (percentiles, quartiles, deciles)
3. Measures of Central tendency – Arithmetic Mean, Weighted Mean, Median, Mode  
(Properties, merits, demerits and uses of different central tendency measures)
4. Measures of Variability – Range, Mean Deviation, Quartile, Deviation, Standard Deviation
5. Skewness and Kurtosis

**Section B**

1. The formal and empirical concepts of Probability
  - Binomial distribution
  - Properties of Normal probability curve and its applications.
2. Concept of Parametric and Non parametric tests
  - Testing hypotheses – One tailed and two tailed tests
  - Type I and Type II errors
  - level of significance, degree of freedom
3. Test of significance of mean and other statistics

**Section C****Parametric tests**

1. Significance of difference between means – application of student ‘t’ test for small samples, paired ‘t’ test

2. Z test for difference between means (Independent and Correlated groups)
3. Analysis of variance: One way and two way classification
4. Correlation: Product moment and Rank correlation

#### Non Parametric tests

1. Chi-Square test - Goodness of fit, independence of attributes (contingency tables)
2. Other non parametric test Mann Whitney's test, Sign test, Kruskal Wallis test

#### References :

1. Garrett, H.E. & Woodworth (2004). *Statistics in Psychology & Education* (11<sup>th</sup> Ed.). Bombay: Vakil, Feffer and Simon.
2. Gupta, S.P. (2000). *Statistical Methods*. New Delhi: Sultan Chand & Sons.
3. Healey, J. F. (2014). *Statistics: A tool for social Sciences. Descriptive statistics*. New Delhi: Sage Publishers
4. Mangal, S.K. (2002). *Statistics in Psychlogy and Education*, (2<sup>nd</sup>ed). New Delhi, India: Prentice Hall.
5. Mendenhall Beaver (2013). *Introduction to probability and statistics* (8<sup>th</sup> Ed). Boston: PWS-Kent, Publishing Company.
6. Pagano, Robert. R, (1990). *Understanding Statistics in Behavioral Sciences*. (3<sup>rd</sup> Ed). New York: West Publishing Company.
7. Wright, S.E. (1986). *Social Science Statistics*. Boston: Allyn and Bacon Inc

## HSC 428P Work Experience/Internship

**Max. Marks : 100**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

Knowing does not automatically result in the ability to “do” or to “feel” which are necessary for professional development. Students need exposure to various setting in family and child welfare to enable them acquire some experience of working with specific target group like children, youth, women and the aged. The assignment will also provide an opportunity for student to get acquainted with innovative projects. It is a sort of work experience for student. Placement Agencies may be Family welfare agencies/ Family courts/ Child guidance clinics / Drugs dedication centers / Counselling centers/ special cells of women in distress/ NGO’s for street and working children./ Juvenile guidance centers./ Rescue homes and shelter homes for women / Orphanages/ ECE centers / Institution meant for special need children.

There will be work experience/Internship of 4-6 weeks of duration during summer vacations after second semester examination.

Every student has to make presentation and submit a report at the beginning of III Semester.

Three components of evaluation

- (i) Appraisal Report be competent authority of the organization in which student completed training (based on regularity, punctuality, ability to work in the team, ability to be sensitive to the client, initiative to organize specific programme). - 30 Marks
- (ii) Report submitted by the student - 30 Marks
- (iii) Oral presentation - 40 Marks

(evaluated by all the staff members and averaged)



## Third Semester

### HSC 502 Adulthood and Ageing

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

L	T	P	C
4	0	0	4

**Learning Outcomes:**

On successful completion of the course students will be able to:

- Understand developmental changes during adulthood and old age
- Demonstrate different aspects of development and adjustments with reference to adulthood and old age
- Examine the principles and influencing factors of development with specific focus on adulthood and old age
- Evaluate the status of adults and elderly in contemporary society

**Syllabus:**

#### Section A

1. Early adulthood (20-35 years)
  - a) Physical, intellectual, social and personality development during early adulthood
  - b) Transition to adulthood (life cycle approach) - security, marriage, marital adjustment and parenthood
  - c) Economic and occupational issues and adjustment
2. Middle adulthood (35-50 years)
  - a) Continuity and change, health and disease, menopause in women, adult sexuality
  - b) Intellectual, personality and social development during middle adulthood
  - c) Occupational aspect – work and career development

#### Section B

3. Late Adulthood and Ageing (50-60 years)
  - a) Continuity and change in personality, the family life cycle
  - b) Psychological and social adjustment
  - c) Planning for retirement – consequences and adjustment
  - d) Health and disease

### Section C

4. Old age (60 years and above)
  - a) Theoretical perspective on ageing process
  - b) Physical aspect of ageing
  - c) Change in personality – social, emotional, cognitive abilities and intellectual aspect
  - d) Problems and adjustment during old age
  - e) Creative adjustment in ageing
  - f) Welfare programmes for old age and society's attempt to provide security for the aged with special reference to India

### References:

1. Bee, Helen L. (1996). *The Journey of Adulthood*, (3<sup>rd</sup> ed.): Upper Saddle River, N J: Prentice Hall.
2. Deats, S.M. & Lenker, L.T. (1991). *Aging and Identity*. London: Praeger.
3. Erber, Joan T. (2011). *Aging and Older Adulthood* (2<sup>nd</sup> ed.) U.S: Wiley-Blackwell.
4. Kermis, (1983). *The Psychology of Human Aging: Theory, Research & Practice*. London: Allyn & Bacon.
5. Lefranciois, G.R. (1996). *The Life span*. New York: Wordsworth Publishers.
6. Mason, Marion G. (2010). *Adulthood and Aging*. New Jersey: Prentice Hall, Inc..
7. Rice, F.P. (1992). *Human Development, A life span approach*. New Jersey: Prentice Hall.
8. Santrock, J.W. (1997). *Life span development*. IOWA: Brown and Bench Mark.
9. Vikery, F.E. (1972). *Creative Programming for older Adults*. Chicago: Association Press.

## HSC 508 Child in the Family

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

### Learning outcomes

On successful completion of the course students will be able to::

- Understand family as component of social cultural milieu and context
- Deal the sensitive issues and crisis situations of family
- Understand human rights and duties
- Play significant and appropriate role in family and social context

### Syllabus:

#### Section A

1. Family in social context
  - a) Sociological significance of family
  - b) Approaches to the study of family: developmental, social, psychological and educational
  - c) Family: structure, functions, roles and relationships
  - d) Influence of SES, culture, religion on family
  - e) Intergenerational conflict within the family
  - f) Family as an eco system
  - g) Intrafamilial influences on the personality development – secure and insecure experiences, crisis in the family; death, divorce, alcoholism, illness, and unemployment

#### Section B

2. Role of the child in the family -
  - a) Child and family interaction, emotional satisfaction
  - b) Expansion of family interest
  - c) Opportunity and insight into the life process
3. Where and how the family helps the individual member through -
  - a) Shared responsibility
  - b) Proper use of leisure hours
  - c) Family customs
  - d) Family rituals

- e) Sacraments
  - f) Sound sex education
4. Mental health & hygiene: meaning, definition, characteristics of good mental health, role of parents in maintaining positive mental health

### **Section C**

#### **Human Rights:**

1. Classification of human rights- normal, legal, political and civil, social emotional and cultural environment and development rights
2. Duties of Indian citizens
3. Child rights:
  - a) Status of Indian children
  - b) Violation of child right and gender disparities
  - c) Children in difficult circumstances
  - d) Child labour, street children, child prostitutes and children of prostitutes
  - e) Remedial measures
  - f) Adoption and adopted child
4. Women's Rights:
  - a) Status of Indian women
  - b) Violation of women rights – violence against women at home, workplace and society
  - c) Sexual harassment and rape
  - d) Remedial measures

#### **Reference:**

1. Ahuja, R. (2014). *Social problems in India*. Jaipur: Rawat Publications.
2. Awasthi, P.K. (2014). *Children and Family Relationship*. Delhi: Ancient Publishing House.
3. Byrne, O. & Dareen, J. (2003). *Human Rights: An Introduction*. New Delhi: Pearson Education.
4. Carson, D. K., Carson, C. K. and Chowdhary, A. (Eds.) (2007). *Indian Family at the Crossroad*. Delhi: Gyan Publishing House.
5. D' Souza, C. & Menon, J., *Understanding Human Rights* (series-4) Bombay: Research and Development centre.

6. Dallos, R. & McLaughlin, E.. (1993). *Social Problems and the Family*. New Delhi: SAGE Publications Ltd.
7. Desai (1991). *Research on Families with problem in India: Issues and implications*. (Vol. II) Mumbai: M Book Publisher.
8. Gupta, U.N. (2004). *The Human Rights*. New Delhi: Atlantic Publishers and Distributors.
9. Lock, S.L. (1992). *Sociology of the Family*. London: Prentice Hall.

## **HSC 520 Introduction to Guidance and Counseling**

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Explain core idea behind guidance and counseling and new emerging areas
- Assess guidance needs of different groups of people using suitable tools
- Plan, implement and evaluate guidance services and programmes
- Collect information about recent researches in field of guidance and counseling
- Explore the vocational opportunities in the field of guidance and counseling

### **Section A**

1. Meaning, concept, need, functions and scope of guidance and counseling
2. Principles, philosophy, basic assumptions, evolution of guidance and counseling movement in India
3. Areas of guidance: education, vocational and personal social
4. Aims & objectives of guidance
5. Group guidance-concept and techniques

### **6. Section B**

1. Various techniques & tools used in guidance: self profile, report of test results and their communication, case study
2. Observing client, visiting home, schools & place of work etc., conducting guidance/ counseling interview

3. Psychological tests on intelligence, creativity, personality, aptitude, attitude & values, their characteristics and uses
4. Role of different personnel in guidance & counseling: principal, teachers, career masters, guidance director, counselor, psychologist, psychiatrist, health specialists, physical instructor, parent, wardens and librarian
5. Need of public relations in guidance
6. Evaluation and research studies in guidance

### **Section C**

1. Guidance services: need, importance, types and procedural details
  - a) Orientation
  - b) Information
  - c) Placement
  - d) Follow up
  - e) Counseling
2. A brief overview of approaches to counseling : directive, non-directive, eclectic and behavioral
3. Emerging areas of counseling

### **References:**

- Bengalee, M. D. (1990). *Guidance and counseling*. Bombay: Sheth Publisher, Pvt. Ltd.
- Crow & Crow. (1960). *Introduction to Guidance*. New Delhi: Eurasia Publishing House.
- Dave, I. (1983). *The Basic Essentials of Counseling*. New Delhi: Sterling Publishers Pvt.
- Erford, B.L. (2007). *Assessment for counsellors*. NY: Lahaska Press.
- Gibson, R.L. & Mitchel, M. (2003). *Introduction to counseling and guidance* (7th ed). Indian Edition Delhi: Pearson Educational.
- Jones, A.J. (1970). *Principles of Guidance & Public Personal Write*. New York: McGraw Hill Book Co. Inc.
- Kenedy, E. (1947). *One Becoming a Counselor: A Basic Guide for Non-Professional Counseling*. New Delhi: Gill & Machmillan.

- Kocher, S.K. (1984). *Guidance and Counseling in Colleges and Universities*. New Delhi: Sterling Publishers Pvt.
- Rao, S.N (1993). *Guidance and Counseling*. New Delhi: Tata McGraw Hill Education Private Limited.

#### **E-resources:**

- Assessment in Counselling and Guidance  
<https://drive.google.com/open?id=0Bwk5FIIsI0ctxVFJCWVpQUTBIRkk>
- Guidance and Counselling  
<https://drive.google.com/open?id=0Bwk5FIIsI0ctxSm5ERUNtTG1KalU>
- Interventions in Counseling  
<https://drive.google.com/open?id=0Bwk5FIIsI0ctxV1IwQ3A2aTVSTOE>

### **HSC 520L Introduction to Guidance and Counseling Lab**

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

#### **Syllabus:**

1. Compile articles and review on various aspects of guidance & counseling
2. Writing articles for guidance purpose
3. Interaction with practicing counselor and guidance worker through visits
4. Need assessment of individual guidance and counseling by purpose suitable tool
5. Organizing guidance sessions for different age groups
6. Planning counseling sessions for children and elderly

## Discipline Electives

### HSC 554 Persons with Special Needs

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**4 0 0 4**

#### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Identify special need persons and assess their problem
- Identify and classify the needs of special persons
- Differentiate causes, effect and special services required for each category
- Evaluate programmes, policies, and institutions of special need persons

#### **Section A**

1. Various terminologies related to children with special needs; meaning, definition and significance of the terms
2. Classification, needs and rights of children with special needs
3. Special Education for children with special needs—principles, objectives and philosophy of teaching
4. Integrated v/s. Segregated approach
5. Concept of rehabilitation and mainstreaming and its need
6. Guidance of children with special needs

#### **Section B**

1. Visual impairment - various anomalies, characteristics of visually impaired and special education
2. Hearing impairment – classification, causes and effect on individual, characteristics, special education
3. Speech and language defects – causes and effects on individual problems and special education
4. Orthopaedically handicapped – various crippling conditions, causes and effects on children and special education

#### **Section C**

1. Learning disability – causes and effects on individual, types, problems, possible remedies and special education



2. Intellectual exceptionality
  - a. Giftedness – characteristics and special education
  - b. Mental retardation – classification, causes and effects on individual, problems in learning, special education
3. Children with emotional disturbance, social maladjustment and juvenile delinquency

### References :

1. Berdins, W. H. & Blackhorst, A. Ed. (1985 ). *Introduction to Special Education* (2<sup>nd</sup> ed. ). New York : Harper Collins.
2. Bullock, Lyndal. M. (1989). *Exceptionalities in children and youth*. Boston : Allyn and Bacon.
3. Dale, N. (1996). *Working with families of children with special needs*: London.
4. Heward, W. L. & Orlansky, M. D. (1992). *Exceptional children: An introductory survey of special education*. (4th ed.). New York: Maxwell Macmillan.
5. Kirk, S. A. & Gallagher, J. J. (2012). *Educating exceptional children* (13<sup>th</sup> ed.). Boston : Cengage learning
6. Mangal, S.K. (2009). *Educating Exception Children: An introduction to Special Education*. New Delhi : PHI Learning.
7. Orlansky, D. & Heward W.L. ( 1988). *Exceptional children; an introductory survey of special education* (4<sup>th</sup> ed.). New York: Merrill. Routledge.
8. Swanson, B. M. & Willis, D. (Eds.). (1979). *Understanding exceptional children and youth*. Chicago: Rand McNally College Publishing Co.
9. Tinbergen, N. & Tinbergen, E.A. (1983). *Autistic children: new hope for a care*. Boston: Allen.
10. Weiss, M. A. & Duffy, M. R. (1979). *Oral language disorders in children: Identification and remediation*. *Journal of Clinical Child & Adolescent Psychology*, 8(3), 206-211.

## HSC 554L Persons with Special Needs Lab

<b>Max. Marks : 100</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>(CA: 40 + ESA: 60)</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

### Syllabus :

1. Visit to local educational and rehabilitation institution
2. Critical analysis with specific reference to organization and management of the agency, administrative policies, available infrastructural facilities and programme implementation
  - Developing proforma to assess the institution functioning
  - Collecting data
  - Preparing reports with suitable recommendations
3. Attitudes of society towards children with special needs
4. Techniques of identification and assessment; tools and approaches to assessment
5. Report writing and presentation of a case study
6. Planning need based programme for children with special need
  - Developing objectives
  - Planning activities
  - Developing suitable aids
  - Execution of prepared programme in mock situation
7. Recent development in welfare programme policies for special children in India & Abroad

## HSC 511 Curriculum for Early Years

<b>Max. Marks : 100</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>(CA: 40 + ESA: 60)</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

### Learning Outcomes:

On successful completion of the course students will be able to:

- Realize the importance of early years and why childhood matters
- Prepare strong plan of action to facilitate different developmental aspects of early years; physical, motor, language, cognitive, social, emotional and moral
- Plan and prepare models and teaching aids for early year teaching

**Syllabus:****Section A**

Early childhood matters

1. Need and importance of curriculum planning in early years
2. Principles of program planning for early years
3. Formulation of goals and objectives- long term and short term goals
4. Weekly and daily plan
5. Determinants of child survival and development
6. Ensuring quality and effectiveness in ECD program

**Section B**

1. ECCE models and approaches
2. Theoretical concepts, programme centered learning environment, role of teacher, role of learner and parents
3. ECCE models
4. Intervention models
5. Innovative programmes
6. Role of parents and community in ECD programmes and curriculum planning

**Section C**

1. Curriculum planning :
2. Activities for ECCE: goals, significance, objectives, criteria & selection of activities, teacher's role related to-
  - Language art
  - Concept development
  - Art and craft activities
  - Music and dance
  - Mathematics
  - Science
  - Social studies
  - Reading / writing
  - Indoor and outdoor play
3. Theme teaching

**References :**

1. Aggarwal, J.C. & Gupta, S. (2007). *Early Childhood Care and Education-Principles & Practices*. Shipra Publication.
2. Grewal, J.S. (1984). *Early Childhood Education*. New York: Macmillan.
3. Hendrick, J. (1988). *The Whole Child- Developmental Education for the Early Years*. Merrill Publishing company.
4. Kulkarni, S. (1988). *Parent Education , perspectives and approaches*. Jaipur: Rawat Publication.
5. Pankajam, G. (1994). *Preschool Education*. Ambala: Indian Publication.
6. Whitebread, D. (2002). *Teaching and Learning in the Early Years*. London: Routledge.

**HSC 511L Curriculum for Early Years Lab****Max. Marks : 100****(CA: 40 + ESA: 60)****L T P C****0 0 4 2****Syllabus :**

1. Observations in various ECCE settings (day care centre, pre-schools, primary schools, anganwadis )
2. Planning program for various ECCE settings
3. Implementing program for ECCE settings
4. Arrangement of stimulating activity areas for various age groups (infants/preschoolers)
5. Plan socio-dramatic play

## **HSC 549 Media Planning and Social Marketing**

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**4 0 0 4**

### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Understand various mass media and their role in national development
- Write script for different media
- Define social marketing and understand the concepts of behaviour change for social good
- Apply the basic and advanced techniques for development of social marketing strategies
- Develop price, promotion and place strategies for a chosen social marketing issue
- Understand how to effectively manage the implementation and evaluation of social marketing projects

### **Syllabus:**

#### **Section A**

1. Mass Media: concept; meaning and characteristics; role of mass media in national development; characteristics and importance of specific media: print media-leaflet, folder, news letter, newspaper and magazine; electronic media-radio, T.V, video, films and internet
2. Script writing: principles and techniques of writing and editing of scripts of different media; print media-news, feature and article; electronic media-feature, interviews, talks for radio, T.V, video and films
3. Contemporary issues in media; introduction to ethics in mass media, freedom in speech, extension and social responsibility; political and government controls on media

#### **Section B**

1. Advertising: concept, types and role of advertisements; analysis of advertisements in media- print, audio and video; designing advertisements for media: print, audio and video

2. Audience segmentation and its importance in advertising; laws, standards & regulations and ethics; an overview of the advertising scene in India; relevance of advertising in marketing
3. Social marketing- Introduction, definition; Steps in the strategic marketing planning process, tips for success: determining research needs and options, choosing a purpose and focus for the plan and conducting situation analysis, determining organizational factors: strengths and weaknesses of the plan determining environmental forces: opportunities and threats

### **Section C**

1. Segmenting, evaluating and selecting target audiences; setting behavioural goals and objectives; identifying barriers, benefits, the competition and influential others; crafting a desired positioning, creating a product platform
2. Price: determining monetary and non-monetary incentives; place: making access convenient and pleasant; promotion: deciding on messages, messengers, and creating strategies, selecting communication channels
3. Developing a plan for monitoring and evaluation; establishing budgets and finding funding; creating an implementation plan and sustaining behaviour

### **References:**

1. Agarwal, B.V. & Gupta, V.S. (2002). *Handbook of Journalism and Mass Communication*.
2. Chunawala, S.A. (2003). *Advertising an Introductory Text*. Himalaya Publishing House.
3. Kotler, P. H. & Lee, N. (2011). *Social Marketing: Influencing Behaviors for Good*. Sage Publications.
4. Mcquail, D. (1994). *Introduction to mass communication*. (3<sup>rd</sup> ed). Sage publication.

### **Journal articles:**

1. Burchell, K., Retti, R. & Patel, K. (2003). *Marketing Social Womens: Social Marketing and the "Social Women Approach*: Journal of Counselors Behaviour, 12 : 1-9.

2. Dibb, S. & Carrigan, M. (2013). *Social marketing transformed: Kotler, Polonsky and Hastings reflect on social marketing in a period of social change*. European, Journal of Marketing, 47(9) pp. 1376–1398.
3. Judith M. & Rafael Z. (2012). *Marketing social missions-adopting social marketing for social entrepreneurship? A conceptual analysis and case study*, International Journal of Nonprofit and Voluntary Sector Marketing. 17: 341–351
4. Kevin B., Ruth, R. & Kavita, P. (2013). *Marketing social norms: Social marketing and the 'social norm approach'* Journal of Consumer Behaviour, 12: 1–9

#### **Case studies:**

1. Wharton School at the University of Pennsylvania, 2014: How the Underbanked Can Prosper from Going Cashless (can be accessed: <http://knowledge.wharton.upenn.edu/article/mastercards-ed-mclaughlin-goingcashless-can-pay-underbanked/>)
2. Wharton School at the University of Pennsylvania, 2014: Why the ALS Ice Bucket Challenge Went Viral (can be accessed: <http://knowledge.wharton.upenn.edu/article/ice-bucket-challenge-viral/>)
3. Wharton School at the University of Pennsylvania, 2014: Brand Challenge: Is There a 'Recipe' for Going Viral? (<http://knowledge.wharton.upenn.edu/article/isthere-a-recipe-for-going-viral/>)

### **HSC 549L Media Planning and Social Marketing Lab**

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**0 0 4 2**

#### **Syllabus:**

1. Preparing write up and/or screenplay for-
  - Electronic media
  - Print media
  - Rural/ folk media
2. Making 2 to 5 minutes movie using a movie making app
3. Making power point presentations using the feature of animation

4. Photography and a shooting assignment on food design/ garment design/ interior design/emotions/ relationship
5. Planning a social marketing campaign with special reference to rural area, women and students
6. Preparation of at least 5 different materials for the social marketing campaign
7. Carrying out a social marketing activity within the campus

## **HSC 555 Planning for Innovative Project and Management**

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Understand the need and feasibility of innovative programmes and projects
- Identify the areas of innovative projects
- Utilize the resources available for programme planning
- Monitor and evaluate projects to ensure the quality

### **Syllabus:**

#### **Section A**

1. Planning and Identification
2. Need, purpose, feasibility of innovative programmes
3. Identifying programmes and projects for different groups and areas (child care and education, special children, women in need, community needs)
4. Project design and strategic planning
5. Steps in planning; Define objectives, time frame, quality specification and outcomes
6. Identifying available resources and issues in outreach



### Section B

1. Monitoring : Meaning and purpose
2. Monitoring the components of project: Objective, clientele, resource mobilization
  - Need and utility of monitoring for effective management.
3. Techniques of monitoring
  - Facets and indicators for monitoring
  - Duration and stages of monitoring process
  - Monitoring quality

### Section C

1. Evaluation
    - Types of Evaluation:
      - Formative, summative, expert evaluation
      - Internal and external evaluation
      - Result oriented evaluation
    - Methods of evaluation
      - Participatory Rapid Assessment
      - Learning assessment
      - Culturally adapted evaluation
- Project appraisal, feed back, fellow-up meetings

### References:

1. Chandra, P. (1995). *Projects – Planning, analysis, selection implementation and review*. New Delhi: Tata McGraw Publishing Company Limited.
2. Singh, P.N. (1994). *Training for management development suchandra publication and indian society*.
3. Kaul, V. (1991). *Early Childhood education programme*. New Delhi: NCERT
4. Jayakaran, R.L. (1996). *Participatory learning and action: user guide and manual*. Medras : world vision India
5. Judith, E.L., Mgers, R.G. & lifeld, E.M. (2000). *Early childhood counts: A Programming guide on early childhood care for development*, Washington: World Bank.

## **HSC 555L Planning for Innovative Project and Management Lab**

**Max. Marks : 100**

**L T P C**

**(CA: 40 + ESA: 60)**

**0 0 4 2**

1. Identifying the need of innovative programmes in different areas child care
  - Special needs children
  - Behavior problem children
  - Disadvantaged children
  - Domestic violence
  - Gender sensitivity
  - Women in need
  - Community issues
  - Parent support system
2. Planning of programmes/projects/workshops etc. for above mentioned areas
3. Implementation of planned programmes/projects/workshops etc.
4. Evaluation and appraisal of the programmes

## Fourth Semester

### HSC 501 Abnormal Psychology

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

#### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Familiarized with various concepts and areas of abnormal psychology
- Able to explain various approaches and therapeutic measures of dealing with abnormal behaviors
- Skilled to deal with different disorders and abnormalities

#### **Section A**

1. Abnormal behaviour :
  - Meaning and definition of abnormal behaviour, multi perspective approach diagnosis and method of assessment.
2. Dealing with disorders :
  - A. Individual psychotherapy -
    - Psychodynamic approach to treatment
    - Behavioural approach to treatment
    - Cognitive approach to treatment
  - B. Group, family and community therapy-
    - Group therapy
    - Family & marital therapy
    - Institutional care and community based services
  - C. Biological therapy -
    - Drugs
    - Electroconvulsive therapy
    - Psychosurgery

#### **Section B**

Emotional disorders :

- Anxiety disorder; meaning and classification, symptoms and identification

- Dissociate and somato form disorder–introduction, classification and identification
- Psychological stress and physical disorder
- Mood disorder

### **Section C**

1. Psychotic and organic disorder:
  - Schizophrenia & Paranoia
  - Organic brain disorder - an introduction
2. Social disorder - brief introduction to following disorders:
  - The addictive disorder - alcoholism, nicotine dependence, other psychoactive drugs
  - Abnormality and variation in sexual behaviour - defining sexual abnormality, sexual dysfunction, sexual deviations

### **References :**

1. Bootzin, R.R., John, R.A. & Lauren, B.A. (1993). *Abnormal psychology* (6<sup>th</sup> ed.) New York, NY: McGraw Hill.
2. Camer, J.R. (1995). *Abnormal Psychology* (2<sup>nd</sup> ed.). New York: W.H Freeman & Company.
3. Carrson, R.C. & Butchar, J.N. (2007). *Abnormal Psychology & Modern Life* (13<sup>th</sup> ed.) New York, NY: Harpers Collins.
4. Christopher, A.K. & Timothy, J.T. (2012). *Abnormal Psychology and Life: A dimensional approach*. Boston: Wadsworth, Cengage Learning.
5. Coleman, C.J. (1996). *Abnormal Psychology & Modern life* (10<sup>th</sup>ed.) London: Scott Forceman & Co.
6. Davison, G.C. & Neale J.M. (1990). *Abnormal Psychology* (5<sup>th</sup>ed.) NY: John Willey.
7. Mangal, S.K. (2008). *Abnormal Psychology*. New Delhi: Sterling Publishing Pvt. Ltd.
8. Oltmanns, T. F. (1995). *Abnormal Psychology*. N. Jersey: Prentice Hall.
9. Sarason, R. & Barbara. (1998). *Abnormal Psychology and Problems of Mal adaptive behaviour*. New Delhi: Prentice Hall.

**E- Resources :**

- Special Education, Encyclopedia of children health-  
<http://www.healthofchildren.com/S/Special-Education.html>
- Educating children with learning problems  
<http://niepid.nic.in/Educating%20Children%20With%20Learning%20Problems.pdf>
- Mental Retardation-  
<http://www.rehabcouncil.nic.in/writereaddata/mr.pdf>

**HSC 525 Parent and Community Education****Max. Marks : 100****(CA: 40 + ESA: 60)**

L	T	P	C
4	0	0	4

**Learning Outcomes:**

On successful completion of the course students will be able to:

- Appreciate the importance of parent and community involvement for overall development of children
- Apply effective methods and techniques for parent and community involvement
- Develop appropriate skills to work with parents and the community
- Plan programmes of parent education and community mobilization

**Syllabus :****Section A**

1. Parenthood: meaning and different theoretical views
  - Tasks of 'Parenting' and being a competent parent
  - Changing concept of parenthood and childhood
2. Parent and community education: - concept, principles, objectives and need
3. Parent involvement:
  - In decision and policy development and other activities
    - Involvement of fathers; need and role of fathers in child development
    - Model eg; of (a) Involving fathers in community based ECD programmes (Israel) (b) Empowering fathers in poverty context, involvement in childcare (Montreal, Canada)

4 Recognizing and empowering parents with special needs:

Single parents, working parents, refugee, migrated and language minority parents, parents of disabled children, socially and economically backward parents, parents of adopted children

**Section B**

1. Techniques of parent and community Education:

- a) Informal meeting, group and individual meetings
- b) Parent and toy library
- c) Parent's corner and workshop/demonstration centers
- d) Open house
- e) Written and printed materials

2. Content of parent and community education:

- a) Development, problems, needs & rights of children
- b) Child rearing and disciplinary techniques, socialization and parental beliefs in various socio-cultural settings
- c) Importance of nutrition, hygiene, health and play for children
- d) Family planning : importance and methods
- e) Local crafts and resources available in community

3. Formulating curricula for parent and community education:

- a) Parent initiated curricula – need and assessment techniques
- b) Expert oriented curricula – guidance and action oriented

**Section C**

1. Contribution of different agencies and community centers in parent and community education

- a) Family planning centers
- b) Hospitals
- c) Maternity and child welfare centers
- d) Schools
- e) PTA
- f) ICDS
- g) WDP
- h) DWACRA

2. Ways of developing human resources and contribution of different professionals in parent and community education
3. Training programmes for young parents : content and need
4. Evaluation of parent and community education programmes

### References :

1. Awasthi, P.K. (2014). *Children and Family Relationship*. Delhi: Ancient Publishing House.
2. Brophy, T. (1977). *Child Development and socialization*, Chicago: Science Research Association Inc.
3. Duerback, A. (1967). *Parents Learn Through Discussion*. Minneapolis: Child Study Association of America.
4. Kulkarni, S. (1988). *Parent Education. Perspectives and Approach*. Jaipur: Rawat Publication.
5. WHO Planning Cornerstone (2007). *Family Planning a Global Handbook for Providers*.

## HSC 525L Parent and Community Education Lab

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

L	T	P	C
0	0	4	2

### Syllabus :

1. Preparation of resource file on parent and community education
2. Explore and evaluate the literature available for parent education
3. Administer a “need assessment checklist” to 30 parents of various stages of family life cycle of rural/urban/tribal and list topics according to priority felt
4. Assessing knowledge of youth & parent regarding various aspect of family and community life
5. Preparing educational material for community participation
6. Starting short action oriented programmes using various techniques of parents education
7. Implementing educational practices for parents of special need families
8. Development of programme based on identifying needs of parents

9. Executing planned programme and simultaneous monitoring, evaluation of the programme
10. Evaluating effectiveness of two programme each on T.V. and Radio relevant to conducting parent and community education
11. Community support programme for child and family for social, personal, educational and vocational success
12. Survey of common problems of community like child marriage, dowry, child labour, child prostitution etc

## **Specialization I : Guidance and Counseling**

### **HSC 517 Guidance and Coping in Crisis**

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**4 0 0 4**

#### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Describe general nature of crisis situation, common reactions and consequences of traumatic events
- Classify different problems behavior and difficult circumstances
- Analyze causes and effect of different problems behavior
- Explore best counseling strategies for different problem behavior

#### **Section A**

##### **Nature, concept and understanding of crisis situations-**

1. Events of crises experiences- at home, at school, and community
2. Effect of crises events on different age groups and role of the family in crisis situation
3. Normal coping process, common reactions and consequences of traumatic events
4. Steps in crisis intervention
5. Skill for managing crisis situation
6. Special counseling challenges-working with ambivalent indifferent and oppositional clients, older adults, children, mentally ill clients, drugs or alcohol abusing clients, exceptional children, clients from different cultures



## **Section B**

### **Dealing with problem situations and guidance for vulnerable /special groups-**

1. Marital and sexual relationship concerns
2. Handling family differences
3. Divorce families, step families, single – parent homes
4. Alcoholic families
5. Violence and abuse, survivals of sexual abuse
6. Counseling about death and dying
7. Suicidal behaviors
8. Latchkey children, homeless children

## **Section C**

### **Counseling children in difficult circumstances**

1. Emotional problems – frustration, inferiority, actual or imagined limitations, fantasy, frequent sad moods, lack of self confidence, feeling of insecurity, excessive fear anxiety and worrying
2. Adjustment problems – aggression, poor socialization, difficulty in maintaining friends, feeling of loneliness, excessive shyness and withdrawal
3. Educational difficulties- school phobia, low achievement, short attention span, truancy, extreme sensitivity
4. Children in conflict with others- fighting, verbal abusiveness, cruelty, destructiveness, tantrums, swearing, lying, stealing

### **References :**

1. Barlci, B.C. & Mukopadhyay, B. (1989). *Guidance & Counseling: A Manual*. New Delhi: Stosius Inc./Advent Books Division.
2. Corey, G. (1981). *Group Counseling*. Brooks/Cole, New Delhi: Engage Leasing India Pvt. Ltd.
3. Gummaer, J. (1984). *Counseling and Therapy for Children*. New York: The Free Press.
4. Hildebrand, V.(1994). *Guiding Young Children*. NY: Mac Millan College Publication Company.
5. Hough, M. (2002). *Practical Approach to Counseling*. Harlow: Pearson Education.

6. Hutchinson, D. (2007). *The Essential Counselor Process, Skills and Techniques*. Lahaska press, Houston Mifflin Company.
7. Jacobs, E.E., Messon, R.L. & Harvill R.L. (2009). *Theory and Practice of Group Counselling*. USA: Cengage Learning.
8. Jones, N.R. (2012). *The Theory and Practice of Counseling Psychology* (5th ed.). South Asia: SAGE.
9. Kenedy, E. (1947). *One Becoming a Counselor: A Basic Guide for Non-Professional* New Delhi : Counseling Gill & Machmillan.
10. Mclead, J. (2009). *Counselling Skills*, Indian Reprint, Jaipur :Rawat Publication.
11. Thompson, C.L. & Linda B.R. (1992). *Counseling Children* (3rd ed.). California: Brooks /Cole Publishing Company.

## **HSC 527 Principles and Procedures in Guidance and Counseling**

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

L	T	P	C
4	0	0	4

### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Get an insight into major theories in the field of guidance and counseling, process involved in different counseling approaches and their application
- Apply learned knowledge and skills to plan different therapies required to enhance the quality of life

### **Syllabus :**

#### **Section A**

1. Meaning, concepts and areas of guidance and counseling
2. The Counselor-
  - a) As person and as a professional- personality and training of counselor
  - b) Client rights and counselor responsibilities
  - c) Therapist competence: ethical and legal aspects
3. Major theories of counseling –
  - a) Person centered

- b) Gestalt
- c) Psychodynamic
- d) Trait factor

### **Section B**

1. Counseling therapies-
  - a) Reality therapy
  - b) Rational emotive therapy
  - c) Cognitive behavior therapy
  - d) Play therapy
  - e) Psychodrama
  - f) Family therapy
  - g) Transactional analysis
2. Consultation process-
  - In school setting
  - Mental health orientation.

### **Section C**

1. Developing the accountable program for counseling and consultation-
  - a) Need assessment
  - b) Data analysis and interpretation
  - c) Identifying program: priorities and goals
  - d) Programs goals
  - e) Communication skills for developing the relationship
  - f) Skills for ending, evaluating counseling programs
2. Counseling and technology-
  - a) Counseling and internet
  - b) Distance education
3. Advance action skills: working with dreams, poetry, stories, humour, expressive arts like; dance, music, visual art and sand play

### **References:**

1. Barlci, B.C. & Mukopadhyay, B. (1989). *Guidance & Counseling: A Manual*. New Delhi: Stosius Inc./Advent Books Division.
2. Dave, I. (1983). *The Basic Essentials of Counseling*. New Delhi: Sterling Publishers Pvt.
3. Gummaer, J. (1984). *Counseling and Therapy for Children*. New York: The Free Press.

4. Ivey, A.E., Ivey M.B., & Downing, L.S. (1987). *Counseling and Psychotherapy: Interpreting Skills, Theory and Practice*. New Jersey : Prentice Hall.
5. Jacoks, E., Robust, .LM. Riley, L., & Harvill (2008). *Group Counseling Strategies and Skills* (6th ed.). USA: Thomson Brooks/Cole.
6. Mithall, M.H. & Gibson, R.L. (2015). *Introduction to Guidance* (7th ed.). New Delhi: Pearson Education Pvt. Ltd.
7. Nelson, J.R. (2012). *The Theory and Practice of Counseling Psychology* (5th ed.). South Asia: SAGE.
8. Pasricha, P. (1976). *Guidance and Counseling in Indian Education*. New Delhi: NCERT Publication.
9. Patterson, L.E. (1999). *The Counseling Process* (5th ed.). USA: Brooks/Cole.

#### **E-resources**

- दूर शिक्षा  
<https://drive.google.com/open?id=0Bwk5FIIsI0ctxZnNfeDRtRWFOZUK>
- Counseling Psychology  
<https://drive.google.com/open?id=0Bwk5FIIsI0ctxOGJ0VWF2Y0dJN0U>
- Counseling Psychology  
<https://drive.google.com/open?id=0Bwk5FIIsI0ctxa2h1N25ZbWZRNUE>
- Distance Education  
<https://drive.google.com/open?id=0Bwk5FIIsI0ctxbnE1SGNEN29wR3M>
- Psychological Theories and Psychotherapy  
<https://drive.google.com/open?id=0Bwk5FIIsI0ctxTU90T2toLUxPcEU>
- Psychopathology  
<https://drive.google.com/open?id=0Bwk5FIIsI0ctxS3NqdE5fVEpxN2M>
- Psychopathology  
<https://drive.google.com/open?id=0Bwk5FIIsI0ctxX0QySVFuNllac0E>
- Psychotherapeutic Methods  
<https://drive.google.com/open?id=0Bwk5FIIsI0ctxS3BJWndMMIBpSWc>

## HSC 537L Practicing Guidance and Counseling Lab

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**0 0 4 2**

### **Learning Outcomes:**

On successful completion of the course students will be able to:

- An ability to analyze a problem, and to identify and define the counseling requirements appropriate to its solution
- An ability to design implement and evaluate counseling solution to meet given set of behavioral problems
- An ability to deal with range of clients and communicate effectively
- An ability to apply theories in the design, reason about, explain and implementation of counseling programmes

### **Syllabus :**

1. Plan and conduct therapeutic intervention programmers related to the following:
  - i. Psychological first aid, handling specific complaints, motivation for re- organizing ones life
  - ii. Prevention program for community harmony: avoiding riots and violence
  - iii. Crises intervention programmers in school
  - iv. Safety measures for children at home, at school and in the community
2. Conduct classroom debates and discussions on the role of media in crisis situation
3. Plan programmes for mental health in crisis situations (preventive and intervention)
4. Compile the articles and research reviews on various aspects of counseling
5. Interactions with practicing counselors and therapists through visits to schools, clinics, women's centers and hospitals
6. Learn about the counseling process – role play, mock sessions
7. Need assessment of individual counseling by using self structured interview schedule and submitting a report
8. Planning counseling sessions for children with special concerns, children in conflict with self and others

9. Planning counseling for treatment of psycho-social and psycho-emotional problems
10. Arranging counseling activities for elderly (with the help of resource persons.)
11. Visit to HIV counseling center and submitting report

## **Specialization II : Early Childhood Education**

### **HSC 513 ECE Centers Organization, Administration and Management**

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

L	T	P	C
4	0	0	4

#### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Gain knowledge for planning, organizing and managing different ECE centers
- Describe the roles and responsibilities of in charge of ECE center
- Classify different ECE centers on the basis of administrative and managerial strategies
- Learn organizational and administration skills for managing ECE centers
- Get insight into problems and issues of legal and ethical nature

#### **Section A**

Administration and organization of ECE centers :

1. Meaning, responsibilities of the incharge of ECE centers
2. Types of schools
3. Opening a new school
4. Beginning the school session
5. Staff selection – qualification, recruiting sources, selection process, notification
6. Personnel practices
7. Supervision of staff
8. Developing staff skills

### Section B

Management of ECE centers:

1. The budget: services, programmes, goals, start up budget, operating budget
2. Food services – plan, purchase and services
3. Equipment and materials – planning the physical environment
4. Maintaining the physical environment

### Section C

1. Building plan
2. Health & social services
3. Licensing
4. Volunteers, resource persons, special visitors
5. Student teacher
6. Parents and community
7. Interpreting the schools to the public
8. Legal issues pertaining to opening a new school

### References :

1. Decker, C.A. & Decker J.R. (1997). *Planning and Administering Early Childhood Programme* (6<sup>th</sup> ed.). NJ: Prentice Hall Inc.
2. Katherine, H. R. (1971). *The Nursery School: A human Relationship Laboratory* (5<sup>th</sup> ed.). Philadelphia: W B Saunders Company.
3. Kaul, V. (1997). *Early childhood education programme*. New Delhi: NCERT.
4. Kimberly, A. & Gordon, B. et.al. (2014). *Early childhood education: becoming a professional*. Los Angeles: Sage Publication.
5. Morrison, G.S. (1988). *Education and development of infant, Toddlers and preschoolers*. Glenview I L, Scott.
6. Murlidharan, R. & Bangerji, U. (1991). *A guide for nursery school teacher*. New Delhi : NCERT.
7. Pankajam, G. (2015). *Pre primary Education Philosophy and Practice*. New Delhi: Concept Publishing Company.
8. Perry, R. (2004). *Teaching Practicing of Early Childhood: A guide for students*. NY: Routledger Palmer.
9. Phyllis, C. (1999). *Administration of School for Young Children*. Delmar Publishers.

## HSC 518 Innovative Programmes and Curriculum Planning for ECE Centers

**Max. Marks : 100**

**L T P C**

**(CA: 40 + ESA: 60)**

**4 0 0 4**

### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Discuss the context of innovative approaches towards ECCE centers
- Analyze the innovative approaches towards ECCE programmes in international, national and regional context
- Apply the innovative techniques in ECE Classrooms

### **Section A**

The context and need for innovative program

1. Change in orientations towards ECCE centers at international and national level (human rights, child rights, elimination of discrimination, equity and equality)
2. Policies for ECCE in India
3. Latest five year plan for ECCE
4. Special needs of special groups of people (tribal children, children with special need , refugees children , children in urban slums)
5. Availability of resources
6. Issues of sustainability and outreach

### **Section B**

1. Overview of innovative approaches (History, Programme Philosophy and other information)
2. International context – community resource centers for ECE Programme (Australia/ Canada)
3. Indian context - Kosabad experience , Mobile crèche, New Delhi, □ URMUL TRUST , CHETNA
4. Innovative program in regional context – WDP Tilonia Rajasthan. Bodh trust Rajasthan

### **Section C**

Innovative techniques used in ECE classrooms

1. Smart classroom



2. Interactive whiteboards
3. classroom computers /projectors
4. You Tube videos
5. Text, Images, Audio, Video, Animation
6. Role Playing
7. E-Learning
8. STEM for beginners
9. Engagement in Purposeful Play
10. Library in ECE classroom

#### **References :**

1. ECCE Experiences in India: GOI Report.
2. ICDS (1996), New Delhi: Department of Women and Child Development, Ministry of HRD. GOI.
3. National Policy of Children, 1986. National Program of Action, 1992, New Delhi. Department of Education, Ministry of Human Resource. GOI.
4. Report of the Expert group on ECCE 175 GW RE by 2022- Niti Aayog. India: GOI.
5. Sub Group Report –ECE in the 12<sup>th</sup> Five Year Plan(2012-2017). New Delhi: Ministry of Women and Child Development.
6. The State of World's Children: 2006, New York , UNICEF.

### **HSC 536L Management and Innovations in Early Childhood Education Lab**

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

#### **Learning Outcomes:**

- Plan, implement, supervise, participate, monitor and evaluate different ECCE programmes
- Acquire skills for organization and management of ECE centers
- Design ECE center lay outs for varied groups
- Plan, set up and develop their own ECE center

**Syllabus :**

1. Orientation to selected innovative programmes that may be in the vicinity
  - Observational visits
  - Discussions in community
  - Video films on programmes, followed by group discussion
2. Survey of various ECE centres to observe
  - Physical facilities: equipments, staff; age and procedure of admission, budget, conduct of programme, records, PTA
3. Planning & executing activities & programmes for EC Centers (Participation in ECE Centers )
4. Evaluation: self assessment and other participants assessment
5. Organize, supervise & monitor – field trip, picnic
6. Project method of conducting nursery school activities
7. Conduct PTM & one home visit

## Food Science and Nutrition

### First Semester

#### HSC 402 Advanced Food Science

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

L	T	P	C
4	0	0	4

#### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Apply and incorporate the principles of Food Science in practical, real-world situations and problems
- Explain the basic principles of sensory analysis and other analytical techniques associated with food
- impart awareness on the concept of ‘new food product development’ and current topics of importance to the Food industry
- Apply the various techniques in the quality evaluation of foods and demonstrate practical proficiency in a food analysis laboratory

#### **Syllabus :**

##### **Section A**

1. Colloidal chemistry as related to foods. Food emulsions and foams
2. Carbohydrates in food
  - a) Sugar: Manufacturing process of sugar, stages of sugar cookery, sugar products
  - b) Polysaccharides
    - i. Starch : Structure, gelatinization, retrogradation, syneresis, gelation, modified food starches, dextrinization
    - ii. Non Starch Polysaccharides: Cellulose, hemicellulose and pectins – sources, characteristics in foods
  - c) Cereals – Structure and composition of wheat and rice
    - i. Flours and flour quality
    - ii. Breakfast cereals

##### **Section B**

1. Protein in Foods:
  - a) Plant foods – pulses, nuts and oilseeds; composition. Antinutritional factors. Fermentation and germination in legumes. Cooking quality

- b) Animal foods –
  - i. Milk – Composition, spoilage and care. Physical and chemical properties
  - ii. Meat, fish and poultry – Structure and composition, Evaluation of egg quality and grading. Use of egg in cookery Postmortem changes in meat
- 2. Fats and Oils:
  - a) Physical and chemical properties
  - b) Rancidity changes
  - c) Antioxidants and synergists
  - d) Changes during frying and storage

### **Section C**

- 1. Fruits and Vegetables – Classification and composition.
  - Effect of heat on vegetables.
  - Preservation of vegetables and fruits.
  - Food Pigments.
  - Browning Reactions.
- 2. Food Additives: Definition, importance, classification and uses.
- 3. Leavening Agents : Importance, classification, nature and use.
- 4. New Food Product Development: Definition, factors shaping new product development – Social concerns, health concerns, impact of technology and market place influence
- 5. Sensory Evaluation
  - a) (i) Selection of panel of judges
  - (ii) Types of tests (an overview)
  - (iii) Judging
  - b) Objective methods for measurement of:
    - (i) Colour
    - (ii) Texture

### **References :**

- 1. Belitz, H.D. & Grosch, W. (1999). *Food Chemistry*. (2<sup>nd</sup> ed.) New York: Springer.
- 2. Charley, H. (1982). *Food Science* (2<sup>nd</sup> ed.) New York: John Wiley and Sons.

3. Manay, N.S. & Shadarssharaswamy, M. (1987). *Foods, Facts and Principles*. New Delhi: Wiley Eastern Ltd.
4. Meyer, L.H. (1978). *Food Chemistry*. New York: Reinhold Book Corporation.
5. Potter, N. & Hotchkings, J.H. (1996). *Food Science* ( 5<sup>th</sup> ed.). New Delhi: CBS Publishers and distributors.
6. Srilakshmi, B. (2001). *Food Science* (2<sup>nd</sup> ed). New Delhi : New Age International Pvt. Ltd.

#### **E –Resources:**

- <https://opened.uoguelph.ca/student-resources/food-science-certificate-Food Science Certificate>
- <https://www.academiccourses.com/Courses/Food-Sciences/Distance-learning/>

### **HSC 402L Advanced Food Science Lab**

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**0 0 4 2**

#### **Syllabus :**

1. Analysis of ash, moisture, crude, fibre and fat content of wheat flour
2. Analysis of milk for total solids, acidity, ash, lactose, specific gravity, fat and protein
3. Determination of protein content of the given sample of wheat flour
4. Determination of Iodine Value, Saponification Value, Acid Value and Peroxide Value of groundnut oil or hydrogenated fat
5. Microscopic structure of raw and cooked starch granules of wheat, maize and potato
6. Gelatinization in various starches – Effect of temperature, acid, sugar and dextrinization
7. Effect of temperature, concentration and acid on crystallization of sugar
8. Sensory Evaluation of food by subjective methods
  - (i) Preparing samples
  - (ii) Using reference samples

- (iii) Product oriented tests
- (iv) Consumer oriented tests
- (v) Reducing panel response error
- (vi) Collecting and analyzing survey data

## HSC 413 Human Physiology

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

### Learning Outcomes:

On successful completion of the course students will be able to:

- Describe the anatomy and physiology of various organs to understand the integrated functioning of all systems in human body
- Relate the dysfunction of organ and occurrence of disease in relation to different internal and external physiological, pathological and environmental conditions
- Analyze blood and urine samples for various parameters

### Syllabus :

#### Section A

1. Definition of anatomy and physiology. Importance of the study of physiology. Brief overview of the cellular and tissue levels of structural organization
  - a) Cell structure and function: Various sub cellular organelles and their functions. Transport across cell membrane and primary cellular communication
  - b) Brief overview of the various types of elementary tissues and their general characteristics
2. Fundamental aspects of the Nervous System –
  - Structure and functions of brain and spinal cord and reflex action, conduction of nerve impulse, synaptic transmission and role of neurotransmitters
3. Endocrine System: Main structural features and functions of endocrine glands:- Hypo-thalamus, pituitary, thyroid, parathyroid, adrenals, ovary, testis,  $\alpha$  and  $\beta$  endocrine cells of the pancreas

### Section B

1. Gastrointestinal Physiology: Secretary, digestive and absorptive functions of the organs of gastrointestinal tract. Roles of liver, pancreas and gall bladder and their dysfunctions. Brief overview of absorption and transport of macronutrients: carbohydrate, fat, protein and micronutrients; calcium, iron and zinc
2. Circulatory System
  - a) Blood – Physical characteristics, general functions, components and their brief description, Blood coagulation, blood groups. Brief overview of anaemia and its types
  - b) Structure and function of heart, blood vessels, regulation of cardiac output, blood pressure and its significance, hypertension
3. Excretory System:- Structure and function of kidney, nephron. Process of urine formation, role of kidney in maintaining blood pH, acid base, electrolyte and water balance

### Section C

1. Homeostasis and its regulation under different conditions by the nervous and endocrine system
2. Musculo- Skeletal System:- Brief overview of structure and function of muscles. Types of muscles. Fundamental points of muscle contraction, metabolism and fatigue
3. Immune System:  
Cell mediated and humoral immunity, defensive properties of neutrophils and macrophages, phagocytosis and inflammation allergy
4. Sense organs: Brief overview of the structure of skin, eye, ear, nose and tongue and their role in the perception of stimuli

### References :

1. Chatterjee, C. (1992). *Human Physiology*, (Vol I & II). Calcutta: Medical Allied Agency,
2. Sanghani, P. B. (2012). *Human Anatomy and Physiology with health education*. New Delhi: Tata Mc Graw Hill Education Private Limited.
3. Sharma, S. (1993). *Practical Biochemistry*, Jaipur: Classic Pub. House.
4. Tortora, G. J. & Derrickson, B. (2006). *Principles of Anatomy and Physiology*. USA: John Wiley & Sons. Inc.

5. Waugh, A. & Grant, A. (2014). *Ross & Wilson Anatomy and Physiology in Health and Illness* (12th ed.). New York; Churchill Livingstone, Elsevier.

#### **E- Resources:**

- Diagram of human body organs -  
<https://in.pinterest.com/pin/429390145695727907/>
- The human body: Anatomy ,facts and functions  
<https://www.livescience.com/37009-human-body.html>

### **HSC 413L Human Physiology Lab**

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

L	T	P	C
0	0	2	1

#### **Syllabus :**

- Determination of blood groups and clotting time
- Estimation of haemoglobin by cyan methemoglobin method.
- Examination of urine : Physical examination, specific gravity, pH, Abnormal (Pathological) constituents: protein, glucose, ketone bodies, bile salts and bile pigments
- Measurement of blood pressure
- Microscopic examination of cells and tissue

### **HSC 417 Research Methods in Food Science and Nutrition**

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

L	T	P	C
4	0	0	4

#### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Explain the significance of research methodology in Food Science and Nutrition
- Distinguish between different types of tools and methods of research
- Analyze a research problem and design research proposals and prepare research report



**Syllabus :****Section A**

1. Scientific method and research
  - a) meaning
  - b) importance
  - c) critical features of research
2. Selection and formulation of a research proposal
  - a) selection of problem area
  - b) review of literature
    - functions
    - sources
  - c) statement of problem
  - d) hypothesis
    - characteristics
    - formulation
  - e) defining concepts
3. Research types – An overview of
  - a) Basic, Applied and Action research
  - b) Quantitative and Qualitative research
  - c) Descriptive, Analytical and Experimental Research
  - d) Rapid Assessment – Participatory Research (PRA and PLA in brief)

**Section B**

1. Research design
  - a) characteristics of good research design
  - b) phases in research design
2. Design strategies in-
  - a) co relational studies
  - b) case studies
  - c) cross sectional surveys
  - d) observational studies
  - e) case control studies

- f) cohort studies
    - retrospective
    - prospective
  - g) intervention trials
  - h) animal studies
3. Ethical considerations in intervention and animal studies

### **Section C**

1. Sampling and measurement –
  - a) sample size and power
  - b) types of sampling
  - c) sampling and non sampling errors
  - d) dependent and independent variables
  - e) scaling techniques
    - nominal
    - ordinal
    - interval
    - ratio scales
  - f) measurement
    - validity
    - reliability
2. Principle steps of a sample survey with special reference to Food Science and Nutrition.
3. Methods of data collection
  - a) Primary data
    - Observation
    - Questionnaire and interview techniques
    - Objective tests and scales
  - b) Secondary data

### **References :**

1. Agarwal, J.C (1966). *Educational Research. An Introduction*. New Delhi : Arya Book Depot .

2. Banclarkar, P.L. and Wilkinson T.S. (2000). *Methodology and Techniques of Social Research* . Mumbai: Himalaya Publishing House
3. Best, J.W. (1977). *Research in Education*. New Delhi: Prentice Hall of India.
4. Bhatnagar, G.L. (1990). *Research Methods and measurement in Behavioural and Social Sciences*, New Delhi Agri: Coll Publishing Academy.
5. Chandra, S.S. & Sharma, R.K. (2004). *Research in Education*. New Delhi: Atlantis Publishers.
6. Kaul, L. (2006). *Research in Education and Psychology*. New Delhi: Vikas Publishers .
7. Mienert, C. L. (1986). *Clinical trials: Design, Conduct and analysis*. New York : Oxford University Press.
8. Nachman's, D. & Chava N. (2008). *Research methods in Social Sciences* (2nd Ed.). New Delhi: St Martin's Press.
9. Scrimshaw, N. S. & Gleason, G. (1992). *Rapid Assessment Procedures. Quantitative Methodologies for planning and evaluation of health related programmes*. Boston, USA: International nutrition foundation for developing countries.

#### **E-Resources:**

- Research methodology, methods and techniques, CR Kothari  
<http://www.modares.ac.ir/uploads/Agr.Oth.Lib.17.pdf>
- Research hypothesis – Slide share  
<https://www.slideshare.net/drjayeshpatidar/research-hypothesis-20719840>

### **HSC 419 Scientific Writing and Nutrition Communication**

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

#### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Understand the structure of various scientific documents
- Write correct in text citations and complete references in approved style(s)

- Comprehend the barriers that lead to ineffective communication
- Apply their minds to come up with the optimal combination of media for nutrition related behaviour change
- Conceive and write short radio programmes, newspaper articles on nutrition

### **Syllabus :**

#### **Section A**

1. Scientific writing as a means of communication
  - a) Different forms of scientific writing.
  - b) Articles in journals, research notes and reports, review articles, dissertation, bibliography.
2. Drafting titles, subtitles, tables, illustrations.
  - a) Presenting data in rows and columns
  - b) Formating tables.
  - c) Presenting data in figures.
  - d) Formating figures.
  - e) Appendices : information to be given and guidelines for writing.
3. The writing process

#### **Section B**

4. Parts of dissertation/research report/article.
  - a) Introduction
  - b) Review of literature
  - c) Method
  - d) Result and discussion
5. Communication
  - a) Concept
  - b) Elements
  - c) Models
  - d) Barriers

#### **Section C**

6. IEC (Information, Education and Communication)
  - a) Introduction and Importance
  - b) Relevance to Programmes

7. Different Media, their characteristics and use -
  - Audio visual aids
8. IEC – methods, techniques and tools
9. Planning effective IEC programmes
10. IEC for different large groups-
  - a) Community
  - b) Grass root functionaries
  - c) Donor agencies
  - d) Policy makers

### References :

1. Dodd, J. S. (Ed.) (1997). The ACS style guide. A Manual for Authors and Editors Washington DC: American Chemical Society.
2. Peat J., Elliott, E., Baur, L. & Keena, V. (2004). *Scientific writing: Easy when you know how*. New Delhi: Byword Viva Publishers Private Limited.

## HSC 419L Scientific Writing and Nutrition Communication Lab

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>

### Syllabus :

1. Preparation of tables and illustrations.
2. Writing a term paper
3. Writing an article for journal (using M.Sc. Project reports)
4. Writing project proposal for grants
5. Preparation of IEC material
  - a) Chart
  - b) Poster
  - c) Power point slides
  - d) Radio talk
  - e) TV show (an outline)
6. Preparation of IEC material on a specific topic for
  - a) One to one
  - b) Group
  - c) Mass communication

## Second Semester

### HSC 405 Biochemistry - I : Biomolecules and Energetics

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**4 0 0 4**

#### Learning Outcomes:

On successful completion of the course students will be able to:

- Explain the biochemical basis of not only macro and micro nutrients but also of the various body processes like digestion, gaseous transport, muscle contraction and the like
- Explain the biochemical basis of food energy production and energy transfer in human beings
- Understand process of detoxication of harmful foreign and endogenous substances by the body tissues
- Carry out biochemical estimations in food composition, analysis and nutritional assessment
- Standardize methods for different estimations

#### Syllabus :

##### Section A

2. An introduction to Biochemistry as a science and an overview of its goals
3. Carbohydrates: Sources, chemistry and functions of mono, oligo and polysaccharides. Dietary fibre and its functions, simple chemical reactions of carbohydrates
4. Lipids : General characteristics and classification, chemistry and sources: Saponification, Iodine, Acid, Reichert Miesel, Peroxide and Acetyl Numbers of fat. Main biological functions of lipids. Rancidity of fat
5. Minerals: Sources, absorption, transport, utilization and functions of Magnesium, Calcium, Phosphorus, Iron, Iodine, Copper and Zinc

##### Section B

1. Proteins: Amino acids as the structural monomers for proteins, structure and simple chemical reactions of amino acids. Levels of structural organization of proteins. Protein classification and biological functions. Plasma proteins and their functions

2. Enzymes : Historical perspective, enzymes as biological catalysts, introductory account of IUB system of enzyme classification, concept of active site, specific activity, turnover number, units of enzyme activity. Effect of substrate concentration on the velocity of single substrate enzyme catalyzed reactions. Michaelis constant ( $K_m$ ) and Maximal Velocity ( $V_{max}$ ). Graphic Method of  $K_m$  evaluation. Line Weaver Burk Plott. Effect of pH and temperature on enzyme catalyzed reactions, various types of enzymes inhibition, iso enzymes
3. Nucleic Acids : Components of nucleic acids, structure of nucleic acids. Significance of DNA as genetic material

### Section C

1. Vitamins: Sources, absorption and biochemical role of Vitamin A,D,E, K; Thiamine, Riboflavin, Niacin, Pyridoxin, Biotin, Folic Acid, Cyanocobalamin and L Ascorbic Acid
2. Biologic Oxidation: Enzymes of biologic oxidation, Redox potential, Respiratory chain  
Oxidative phosphorylation, Mitchell's chemiosmotic hypothesis.  
Inhibitors of respiratory chain and oxidative phosphorylation
3. Detoxication of foreign compounds. Various reactions of detoxication. Role of liver in detoxication. Role of hepatic microsomal enzyme in detoxication

### References:

1. Deb, A.C. (1997). *Fundamentals of Biochemistry*. Kolkata: New Central Book Agency.
2. Murray, R.K., Granner, D.K., Mayes. D.A. & Rodwell, V.W. (2000). *Harpers Biochemistry* (25th ed.). New York:Macmillan Publishers.
3. Nelson, D.C. & Cox, M. (2000). *Lehninger's Principles of Biochemistry* (3<sup>rd</sup> ed.). New York: Macmillan Publishers.
4. Rama, R. AVSS (2010). *A Text book of Biochemistry*. Tahuku (AP): L.K. and S. Publishers.
5. Sharma, S. (2000). *Human Nutrition and Meal Planning*. New Delhi. Jnanda Prakashan .
6. Talwar, G.P. : *A Text Book of Biochemistry and Human Biology*. New Delhi: Prentice Hall of India.

## HSC 405L Biochemistry - I : Biomolecules and Energetics Lab

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

L	T	P	C
0	0	4	2

### Syllabus :

1. pH determination by pH papers and pH meter
2. Extraction and estimation of total lipid content of wheat grain or any other food stuff
3. Standardization of a method of blood glucose estimation
4. Estimation of blood glucose of a normal and diabetic person by the method standardized
5. Titrametric estimation of vitamin C in lemon juice or any other fresh food stuff
6. Standardization of methods for serum total protein and albumin
7. Estimation of total protein and albumin by the method standardized for a well nourished and a protein malnourished person
8. Formal titration of amino acid.
9. Standardization of a method for the determination of reducing sugars

## HSC 409 Food Microbiology

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

L	T	P	C
4	0	0	4

### Learning Outcomes:

On successful completion of the course students will be able to:

- Identify the important pathogens and spoilage microorganisms in foods and the conditions under which they grow
- Utilize laboratory techniques to identify microorganisms in food
- Describe role and significance of microbial inactivation, adaptation and environmental factors on growth and response of microorganisms in various environments
- Identify the conditions under which the important pathogens and spoilage microorganisms are commonly inactivated, killed or made harmless in foods



- Recognize the elements of the Hazard Analysis Critical Control Point (HACCP) system
- Define "food borne disease outbreak", and design a good food borne disease surveillance program

### **Syllabus :**

#### **Section A**

1. Microorganisms of importance in food : Their primary sources in foods. Morphology; cultural characteristics and biochemical activities.
2. Main characteristics of microbial growth
3. Factors affecting their growth in food. Intrinsic and Extrinsic parameters that affect microbial growth and their relevance to food spoilage and preservation.

#### **Section B**

1. Spoilage of different groups of food: Cereal and cereal products, vegetables and fruits, meat and meat products, eggs and poultry, milk and milk products, canned foods.
2. Food Preservation:
  - a) Physical methods – Drying, cold storage, heat treatments, irradiation.
  - b) Chemical preservatives and natural antimicrobial compounds.
  - c) Biologically based preservation systems and probiotic bacteria.
3. Microorganisms in food enzyme and technology:
  - a) Food Fermentation – An introduction.
  - b) Enzyme and food production
  - c) Micro-organisms as food.

#### **Section C**

1. Food borne diseases : Foods involved, the disease, conditions necessary for an outbreak, prevention of outbreaks for –
  - a) Food borne intoxication: Botulism and staphylococcal intoxication.
  - b) Food borne infections – Salmonellosis, Clostridium perfringens illness, Bacillus cereus gastroenteritis.
  - c) Investigation of food borne disease outbreak.
2. The HACCP system and food safety used in controlling microbiological hazards.

**References :**

1. Adams, M.R. & Moss M.G. (2008). *Food Microbiology* (1<sup>st</sup> ed.). New Delhi: New Age International (P) Ltd.
2. Atlas, M. R. (1995). *Principles of Microbiology*. Missouri, U.S.A.: Mosby – Year Book, Inc.
3. Banwart, G.(2004). *Basic Food Microbiology* (2<sup>nd</sup> ed). New Delhi: CBS Publishers.
4. Frazier, W.C. & Westhoff D. C. (2014) *Food Microbiology*. New York: Mc Graw Hill Inc.
5. Jay, J.M. (2005). *Food Microbiology* (6<sup>th</sup>ed.). Maryland: Aspen Publishers, Inc.
6. Pelczar, M.I. & Reid, R.D. (1998). *Microbiology*. New York: McGraw Hill Book Company.

**E-Resources:**

- Microbiology and Food Safety  
<https://swayam.gov.in/courses/5147-food-microbiology-and-food-safety-Food>
- Food and dairy Microbiology  
[https://swayam.gov.in/courses/4626-environmental-food-and-dairy-microbiology- Environmental](https://swayam.gov.in/courses/4626-environmental-food-and-dairy-microbiology-Environmental)
- Microbiology learning and education online  
[https://jcm.asm.org/content/54/5/1203- Microbiology](https://jcm.asm.org/content/54/5/1203-Microbiology)  
<https://microbiologyonline.org/-Microbiology Online>

**HSC 409L Food Microbiology Lab**

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>

**Syllabus :**

- Cleaning and sterilization procedure of glassware.
- Preparation of common laboratory media.

- Techniques of culturing on liquid and solid media
- Staining of Bacteria: Gram's staining and spore staining
- Determination of microbial number – plate and slide counts
- Bacteriological analysis of water and milk.

## **HSC 414 Nutritional Epidemiology Paediatric and Geriatric Nutrition**

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

### **Learning Outcomes:**

On successful completion of the course students will be able to:

- get acquainted with elements of descriptive nutritional epidemiology and its importance in community and public health/ nutrition research
- provide lactational counselling
- suggest feeding solutions to pre term and low birth weight infants
- become ambassadors for exclusive breastfeeding and timely weaning
- prescribe preventive health and therapeutic diets to the elderly

### **Syllabus :**

#### **Section A**

1. Nutritional Epidemiology : introduction, aims and purposes.  
Principles of Nutritional Epidemiology  
Types of Epidemiology and sources of information
2. Descriptive Epidemiology, cross sectional analysis  
Prevalence and incidence, Risk factors,  
Socio demographic and Psychosocial variables

#### **Section B**

#### **Paediatric Nutrition**

1. Nutrition during infancy
  - a) Breast feeding – colostrum, composition and importance; initiation of breast feeding and duration, advantage of breast feeding.
  - b) Introduction of complementary foods – initiation and management of weaning; mixed feeding

- c) Management of problems.
- d) Management of pre term and LBW infants
- 2 a) Nutritional needs of toddlers, preschool and school going children.
- b) Feeding children with special needs

### Section C

- 1. Geriatric Nutrition
  - a) The Ageing Process – Chronological and Physiological Ageing, changes in body composition
  - b) Explanation of the terms – Andropause, Menopause
    - Hormonal interplay during Menopause and its consequences. HRT (Hormonal therapy) and food based intervention in post-menopausal women
- 2. Nutritional factors conducive to healthy ageing
  - a) General consideration in the nutrition of the aged
  - b) Recipes for the elderly

### References:

- 1. Burr, M. L. (1983). Epidemiology for nutritionist, some general principles, Human nutrition, Applied nutrition. 37(A), 259-264.
- 2. Chaudhary, A. (2001). Active ageing in the new Millennium. Delhi : Anugraha publishing,.
- 3. Merrill, M. R. (2010). *Environmental Epidemiology: Principles and Methods*. Massachusetts : Jones and Bartlett publishers, student ed.
- 4. Moon, G. & Gould, M. (2000). Epidemiology: An introduction. Philadelphia Open University Press.
- 5. Sharma, O.P. (1999). *Geriatric care in India – Geriatrics and Gerontology. A textbook*. Delhi : ANB publishers.
- 6. Visweswara, R. K. (1996). *Biostatistics- A manual of statistical methods for use in health and nutrition*. New Delhi : Jaypee brothers Medical Publishers.
- 7. Wallace, H. M., Giri, K. (1990). *Health care of women and children in developing countries*, Oakland: 3<sup>rd</sup> party publishing Co.
- 8. Willett, W. (1983). *Nutritional epidemiology*. New York : Oxford University Press.

## HSC 414L Nutritional Epidemiology Paediatric and Geriatric Nutrition Lab

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

L	T	P	C
0	0	2	1

### Syllabus :

1. To plan an epidemiological study
2. To plan and prepare nutrient dense, complementary foods for 6-12 month old infants.
3. To plan and prepare dietary schedule for infants
4. To plan and prepare diet to promote catch up growth after acute diarrhea/infection
5. To plan and prepare diet for elderly in health
6. To plan and prepare dental soft diet for elderly
7. To plan and prepare diet for elderly during ill health

## HSC 415 Problems in Human Nutrition

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

L	T	P	C
4	0	0	4

### Learning Outcomes:

On successful completion of the course students will be able to:

- Differentiate the nutritional deficiency diseases on the basis of clinical symptoms
- Field survey on biochemical and clinical manifestations, preventive and therapeutic measures of the problems in human nutrition
- Compose various diets with the help of functional foods and nutraceuticals for management of diseases
- Review prevalence of various diseases in Indian scenario

### Syllabus :

#### Section A

1. Pathogenesis of nutritional deficiency disease development: Primary and secondary nutritional inadequacies, tissue depletion, biochemical lesions, functional changes, anatomic lesions. Concept of acute and chronic disease

2. Protein energy malnutrition – concept, classification (Gomez, Wellcom, Waterlow), prevalence
  - a) Pathophysiology of PEM in children , biochemical lesions and functional changes
  - b) Management of PEM – general and three stages of hospital management

### **Section B**

2. Vitamin A deficiency and xerophthalmia – ocular manifestations.  
Primary and secondary causes of vitamin A deficiency- treatment, prevention, toxicity.
  - a) Nutritional anaemia – Iron deficiency anaemia - clinical signs and symptoms, diagnosis and treatment.
  - b) Vitamin B<sub>12</sub> deficiency anaemia – signs and symptom, diagnosis, nutritional management.
  - c) Folate deficiency anaemia – clinical effects , detection , neural tube defects and nutritional management.
3. Iodine deficiency disorders – prevalence , physiology of iodine deficiency , iodine deficiency in foetus, neonate , infants, children and adults.
  - a) Definitions of Goiter and Endemic cretinism.
  - b) Methods for correcting iodine deficiency
4. An overview of fluorosis and osteoporosis

### **Section C**

1. Risk factors and etiology, metabolic changes, diagnosis, preventive measures, treatment, nutrition and diet related management of-
  - a) obesity, type 1 and 2 diabetes mellitus, cardiovascular diseases and hypertension. Use and health effects of very low calorie diet, DASH diet and prudent diet
2. Functional Foods and Nutraceuticals
  - a) History, definition and concept. Classification of nutraceuticals and functional foods. Significance and relevance of nutraceuticals and functional foods in the management of diseases
  - b) Natural occurrence of phytochemicals- Antioxidants and flavonoids, omega
3. fatty acids, carotenoids, dietary fiber, phytoestrogens, glucosinolates, organosulphur compounds. Health benefit with adequate safety

**References :**

1. Antia, F.P. & Philip A. (1997). *Clinical Dietetics and Nutrition*. Delhi: Oxford University Press.
2. Bamji, M.S. Rao, P.N., & Reddy, V. (1996): *Text book of Human Nutrition*. London: Oxford and IBH Publishing Co, Pvt. Ltd..
3. Banergi, R., Verma, A.K., & Siddqui, M.W. (2017). *Natural Antioxidant: Application in foods of animal origin*. Apple Academic press.
4. Mahan, k., & Escott, S. S. (2000). *Krauses food nutrition and diet therapy*. Philadelphia: W.B. Saunders.
5. Passmore, R. ., & Eastwood, M. A.(1986). *Davidson and Passmore Human Nutrition and Dietetics* .London : Churchill Livingstone
6. Shils, M.E., Olson, J.A., Shike, M., & Ross A.C.(1999). *Modern Nutrition in Health and Disease*. Philadelphia: Willians and Wilkins.
7. Wardlaw , C.M., Paul, M., & Insel. (1993). *Perspective in Nutrition*. St. Louis: Mosby. .

**E-Resources:**

- Burden of Disease in India  
[https://www.who.int/macrohealth/action/NCMH\\_Burden%20of%20dis ease\\_\(29%20Sep%202005\).pdf](https://www.who.int/macrohealth/action/NCMH_Burden%20of%20dis ease_(29%20Sep%202005).pdf)
- National family health survey -4  
[http://rchiips.org/nfhs/factsheet\\_nfhs-4.shtml](http://rchiips.org/nfhs/factsheet_nfhs-4.shtml)
- DietaryGuidelines for Indians  
<http://ninindia.org/DietaryGuidelinesforNINwebsite.pdf>
- ICMR guidelines for management of type 2 diabetes 2018  
<https://medibulletin.com/wp-content/uploads/2018/05/ICMR.diabetesGuidelines.2018.pdf>

## HSC 429L Problems in Human Nutrition Lab

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

L	T	P	C
0	0	4	2

### Syllabus :

#### A. Planning, preparation, serving of diet for following disorders:

- a) Protein – energy malnutrition
- b) Vitamin A deficiency
- c) Nutritional anaemia
- d) Osteoporosis
- e) Obesity
- f) Diabetes mellitus
- g) Hypertension and
- h) Atherosclerosis

#### B. Nutritional counselling for following disorders

- a) Protein – energy malnutrition,
- b) Vitamin A deficiency,
- c) Nutritional anaemia
- d) Osteoporosis
- e) Obesity
- f) Diabetes mellitus,
- g) Hypertension and
- h) Atherosclerosis.

## HSC 422 Statistical Methods in Food Science and Nutrition

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

L	T	P	C
4	0	0	4

### Learning Outcomes:

On successful completion of the course students will be able to:

- Discuss the significance of statistics in the discipline of Food Science and Nutrition
- Describe basic concepts of statistical inferences and test of significance
- Apply the appropriate statistical technique for analysis and interpretation of data



**Syllabus :****Section A**

1. Scope and role of statistics in Food Science & Nutrition
2. Treatment of data – collection of primary and secondary data
3. Representation of data: Tabular, diagrammatic and graphical methods. Frequency distribution, histograms, frequency polygons, ogives.
4. Measurement of central tendency – Arithmetic mean, Median, Mode. Selection of appropriate measures of central tendency
5. Measures of Dispersion – Range, Quartile and Interquartile deviation, Mean deviation, Standard deviation, Coefficient of variation.

**Section B**

1. Correlation : Pearsons' coefficient of correlation, Rank correlation.
2. Regression, Odds Ratio
3. Sampling: Types, sample survey versus census survey, sample size, probability & non probability sampling techniques
4. Normal Distribution with its application
5. Testing of hypothesis – Meaning and need, one tail and two tail tests, large and small sample tests, type I and type II errors, degree of freedom

**Section C**

1. Parametric test of significance for large and small samples – Mean, variance, proportion and correlation coefficient.
2. ANOVA – one way and two way.
3. Non parametric tests
  - a) Chi square test and goodness of fit.
  - b) Kruskal Wallis test
  - c) Mann Whitney U Test
  - d) Sign Test
4. Design of experiment – layout and analysis of completely randomized design (CRD) and randomized block design (RBD)
5. Vital statistics : Introduction and its application.

**References :**

1. Garrett, H.E. & Woodworth (2004). *Statistics in Psychology & Education* (11<sup>th</sup> Ed.). Bombay, Vakil, Feffer and Simon.

2. Gupta, S.P. (2000). *Statistical Methods*. New Delhi: Sultan Chand & Sons.
3. Healey, J. F. (2014). *Statistics: A tool for social Sciences. Descriptive statistics*. New Delhi : Sage Publishers
4. Mangal, S.K. (2002). *Statistics in Psychology and Education*, (2<sup>nd</sup> Ed). New Delhi, India : Prentice Hall .
5. Mendenhall, B. (2013). *Introduction to probability and statistics* (8<sup>th</sup> Ed). Boston: PWS-Kent, Publishing Company.
6. Pagano, Robert. R, (1990). *Understanding Statistics in Behavioral Sciences*. (3<sup>rd</sup> Ed). New York: West Publishing Company.
7. Wright, S.E., (1986). *Social Science Statistics*. Boston: Allyn and Bacon Inc

### **HSC 428P Work Experience/Internship**

**Max. Marks : 100**

**L T P C**

**(CA: 40 + ESA: 60)**

**0 0 4 2**

With emphasis on 'Experiencing and Doing are Believing, enabling the student acquire some experience of working with specific target groups like children, youth, women and the aged in terms of their health and nutritional well being. The assignment will also provide an opportunity for students to get acquainted with innovative programmes that give them experience. The students would see for themselves the running of the agency they work in, be it a hospital catering, food processing and packaging unit, or an NGO engaged in community nutrition

There will be work experience/Internship of 4-6 weeks of duration during summer vacations after second semester examination.

Every student has to make presentation and submit a report at the beginning of III Semester.

Three components of evaluation

- (i) Appraisal Report by competent authority of the organization in which student completed training (based on regularity, punctuality, ability to work in the team, ability to be sensitive to the client, initiative to organize specific programme). - 30 Marks
- (ii) Report submitted by the student - 30 Marks
- (iii) Oral presentation - 40 Marks  
(evaluated by all the staff members and averaged)

## Third Semester

### HSC 506 Applied and Community Nutrition

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**4 0 0 4**

#### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Understand the applications of nutrition in public health
- Comprehend the determinants of food and nutrition security
- Work and collect data pertaining to nutrition and health in the field situation
- Design strategies to facilitate community participation
- State the strengths and weaknesses of the ongoing nutrition programmes

#### **Section A**

Introduction to Community Nutrition:

1. Definition of important concepts , community nutrition goals, skills and strategies made for their achievements
2. Formulation of food production targets, Food security, Food safety, Nutrition security, National Nutrition Policy

#### **Section B**

Nutrition Programme Management:

1. Introduction to Management – Definition , objectives and components of -
  - a. Planning
  - b. Implementation
  - c. Evaluation
2. Types of Supervision- relevance of supervision in nutrition programme management
3. Monitoring and Evaluation (Process and Impact,) National Nutrition Monitoring Bureau (NNMB)
4. The art and Science of field work.

5. Operations research – Definition and its application in nutrition programme management. An overview of response surface methodology (RSM) as a technique of process optimization
6. Community Participation – concepts and approaches

### **Section C**

Other Measures to combat under nutrition :

1. Nutrition in primary health care and family welfare programmes
2. Nutritional Surveillance
3. Nutritional Rehabilitation for PEM in children, severe anaemia

Critique and Review of :

1. Integrated Child Development services
2. Mid Day Meal Programme
3. Anaemia Prophylaxis and Vitamin A Prophylaxis Programmes
4. Iodine Deficiency Disorders Control Programme

### **References :**

1. Dahama, O.P. & Bhatnagar O.P. (1991). *Education and Communication for Development*. New Delhi: Oxford and IBH Publishing Co. Pvt. Ltd.
2. Gopaldas, T. & Seshadri S. (Ed.).(1987). *Nutrition- Monitoring and Assessment*. New Delhi : Oxford University Press.
3. Park, K. (2007). *Park's Textbook of Preventive and Social Medicine*. Jabalpur: Banarasidas Bhanot Publishers.
4. THCU. (2001). Introduction to Health Promotion Program Planning (Version 3.0). The Health Communication Unit, Centre for Health Promotion, University of Toronto.
5. Wadhwa, A. & Sharma S. (2006). Nutrition in the Community- A Text Book. New Delhi: Elite Publishing House Pvt. Ltd.

## **HSC 506L Applied and Community Nutrition Lab**

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**0 0 2 1**

### **Syllabus :**

1. Planning and conducting nutrition education projects for a community using different extension methods and audio visual aids.
  - Study of existing diet and nutrition practices
  - Planning
  - Conducting survey and imparting education
  - Analyzing data
  - Writing report
2. Visit to the ongoing national nutrition programmes

## **HSC 547 Institutional Food Administration (IFA) and Country and Continental Cuisines**

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**4 0 0 4**

### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Describe the food service management in different settings
- Estimate the various types of food service in different situations
- Estimate the cost of any meal
- Plan and develop different types of menu for food service establishment

### **Syllabus:**

#### **Section A**

1. Introduction of Food Service Institutions
  - School , Industrial canteen, Hospital, Travel catering, Commercial food service
  - Characteristics of food services establishment

2. Food Service Management
  - Definition, Principles
  - Organization Chart for *Dhaba* , Canteen, Restaurant
3. Personnel Management
  - Recruitment and selection
  - Induction
  - Training and motivation

### **Section B**

1. Financial Management
  - Cost Concept : Component of costs; fixed, semi fixed and variable costs, food cost analysis, costing of dishes, methods of pricing
  - Book keeping and Accounting – Systems of book keeping , Books of accounts- Cash book, Purchase book, Sales book; Purchases return book and Sales return book
2. Organization of Spaces
  - Kitchen spaces : Types of kitchen , designing kitchens
  - Storage spaces: Types, sanitation and safety
  - Planning service areas
3. Equipment Planning for Food Service
  - Classification and selection of equipment
  - Care and maintenance of equipment

### **Section C**

1. Menu Planning and Food Service
  - Definition and functions of a menu
  - Types of menu
  - Construction of menu
  - Types of food service- Table, Assisted, Self-service, Single point, Specialized
2. Food Production Systems Management
  - Production forecasting and scheduling
  - Production control- Use of standardized recipes, process of recipe standardization
  - Safeguard in food production
3. Study of Cuisines
  - Menu designing and characteristics of following cuisines-Indian, Chinese, Continental, French, Thai and Mexican

**References:**

1. Kazarion, E. (1989). *A Food Service Facilities Planning*. Hoboken, New Jersey: John Wiley and Sons, Inc.
2. Powers, J.M. (1979). *Basics of Quantity Food Production*. Hoboken, New Jersey: John Wiley and Sons, Inc.
3. Reynolds, D. & Wachter, K. (2013). *Food Service Management Fundamentals*. Hoboken, New Jersey: John Wiley and Sons, Inc.
4. Sethi, M. & Malhan, S. (2014). *Catering Management: An Integrated Approach*. (3<sup>rd</sup> ed.). New Delhi: New Age International Pvt. Ltd.
5. Williams, M.M. (2012). *Fundamentals of Meal Management*. Dorling Kindersley India Pvt. Ltd.

**E- Resources:**

- Types of food services  
[https://www.tutorialspoint.com/food\\_and\\_beverage\\_services/food\\_and\\_beverage\\_services\\_types\\_of\\_service.htm](https://www.tutorialspoint.com/food_and_beverage_services/food_and_beverage_services_types_of_service.htm)
- Styles of Catering Operations  
<https://www.shfm-online.org/CMS/Resources/bok/conference%20&%20catering/styles%20of%20catering.pdf>

## **HSC 547L Institutional Food Administration (IFA) and Country and Continental Cuisines Lab**

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>

**Syllabus:**

1. Survey to find out prevailing prices of foodstuffs
2. Analysis of relationship between purchased amount, edible portion and cooked weight of foodstuffs
3. Recipe conversion ( ingredients, yield, serving size)
4. Planning meal(s) for college hostel mess

5. Planning and organizing meal for railway base kitchen
6. Planning and organizing meal for a birthday party
7. Planning menus for quantity and preparation of recipes from Chinese, Continental and American cuisines
8. Visit to different types of food service institutions and studying the following
  - Organization
  - Physical plan and layout
  - Food Service equipments
  - Sanitation and hygiene

## **HSC 521 Metabolism and Diagnostic Biochemistry**

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Explain the metabolism of carbohydrate, lipid and protein :the macronutrients present in food along with the role played by vitamins and minerals : the micronutrients and relationship between human nutrition and metabolism
- Carry assessment of nutritional status of individuals through biochemical indices in quantitative terms
- Carry out biochemical estimations and biochemical basis of diagnosis of certain diseases

### **Syllabus:**

#### **Section A**

1. Glycolysis , alcoholic fermentation as a variant of glycolytic pathway. Direct oxidation (HMP shunt) pathway of glucose metabolism. Gluconeogenesis
2. All aspects of the regulation of blood glucose level. TCA (Krebs's) cycle and its significance as amphibiotic pathway



### 3. $\beta$ – oxidation pathway of fatty acid catabolism

Role of carnitine in beta oxidation of fatty acids, De novo synthesis and chain elongation of saturated fatty acids , Metabolism of ketone bodies, Metabolism of cholesterol, Lipoprotein metabolism in brief and its relationship with lipid transport and arteriosclerosis

### Section B

1. General reactions of protein metabolism : Synthesis of Urea – the urea cycle (Kreb's Hanselitt cycle), Biosynthesis of proteins, Basic aspects of Metabolism of Uric Acid and its nutritional implications
2. General hierarchical organization of mammalian endocrine system – mode of action of insulin, glucagon, epinephrine, thyroid and steroid hormones

### Section C

1. Collection and preservation of biological fluids- Patterns of functional and non functional enzymes of blood plasma in health and diseases with specific mention to serum lipase, amylase, cholinesterase , alkaline and acid phosphatases, serum transaminases, lactate dehydrogenase (LDH) and creatine phosphokinase(CPk)
2. Introduction to the functional biochemistry of liver – A brief description of liver function tests

### References :

1. Deb, A.C. (2008). *A Text book of Biochemistry* . Kolkata : New Central Book Agency.
2. Murray, R.K, Granner, D.K., Mayes, D.A. and Radwell V.W. (2000). *Harpers Biochemistry* (25<sup>th</sup> ed.). New York : Macmillan Publishers.
3. Nelson, D.C. and Cox, M.M.(2000). *Lehningers Principles of Biochemistry* (3<sup>rd</sup> ed). New York : Macmillan Publishers.
4. Rama Rao, A.V.S.S. (2007). *Text book of Biochemistry*. Tahuka, (AP) : L.K. and publishers.
5. Sharma, S. (2007). *Experiments and Techniques in Biochemistry*. New Delhi : Galgotia Publishers .
6. Sharma, S.(2000). *Human Nutrition and Meal Planning*. New Delhi: Nanda Prakashan.
7. Talwar, G.P.(2005). *A Text book of biochemistry and Human Biology*. New Delhi : Prentice Hall of India.

## HSC 521L Metabolism and Diagnostic Biochemistry Lab

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**0 0 4 2**

### Syllabus :

1. Estimation of total, free and conjugated, bilirubin in blood serum
2. Estimation of total and lipoprotein cholesterol in blood serum.
3. Estimation of triglycerides in blood serum.
4. Assay of alkaline phosphatase activity in serum.
5. Assay of the activity of transaminases (SGOT, SGPT) in serum.
6. Assay of the trypsin activity inhibition by some legume antinutritional factors

## Discipline Electives

### HSC 505 Advanced Nutrition

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**4 0 0 4**

### Learning Outcomes:

On successful completion of the course students will be able to:

- Apply various methods of estimation of body composition
- estimate protein quality of food stuffs
- estimate nutritional requirements of different groups and make recommendations through life cycle
- conduct laboratory and anthropometric methods of assessment of nutritional status

### Section A

1. Development of Nutrition as a science, metamorphosis of the science of nutrition in historical perspective
2. Body Composition: Concept of body composition biochemical composition, Nutritional anthropometry, Skin fold thickness, measurement and calculation of body density using Archimedes' principle and hydrometry. Calculation of percent body water and body fat from body density. Dilution techniques and calculation of indices of body composition. Lean body weight and fat free body weight. Concept of body cell mass and its determination by isotopic measurement. Application of body composition data

3. Evaluation of protein quality :In vitro evaluation- Chemical score, Protein digestibility coefficient, PDCAAS

In vivo evaluation- Biological value (BV), Net protein utilization (NPU), Protein efficiency ratio (PER), NDP caloric percent.

### **Section B**

1. Concepts of energy expenditures and their application. Units of energy, measurement of energy expenditure by direct and indirect calorimetry. Calculation of non protein respiratory quotient and its conversion to quantity of carbohydrate and fat (in grams) metabolized. Determination of amount of protein metabolized and calculation of total heat production of the diet, basal metabolism, BMR and its measurement. Calculation of surface area from equations and monograms, SDA of food and its interpretation, calculation of energy expenditure of an average reference man and woman, regulation of energy balance
2. Perspectives in human nutritional requirements. Different methods of estimating nutritional requirements and their critical evaluation. Estimation of Energy, Protein, Fat, Iron, Calcium, vitamin A and vitamin C requirements
3. Regulation of food intake: Hunger and appetite, gastrointestinal factors in the regulation. Role of hypothalamus, glucose utilization in the body and fat stored in the body as regulators of food intake, regulation of body weight

### **Section C**

1. Nutrition, immunity and infection. Innate and adaptive immunity. Primary and secondary lymphoid organs. Cell mediated and humoral immunity. T and B lymphocytes, antibody response, primary and secondary infection . Role of nutrition in immune functions, Immune aberrations – AIDS
2. Nutrition and stress - Stress types, Body's response (endocrine and metabolic) to short term and long term stress. Role of nutrition in stress coping
3. Non nutritive food components with potential health effects- polyphenols, tannins, phytates, phytoestrogens

**References :**

1. *Annual Reviews of Nutrition*(1981). California USA : Annual review INC
2. Bamji M.S., Krishnaswamy, K., Brahman G. N. V. (2017). *Text Book of Human Nutrition* 4<sup>th</sup> Ed.. New Delhi : Oxford and IBH publishing Co Pvt. Ltd..
3. Davidson, S. S., Passmore, L., Eastwood, M. A. (1986). Davidson and Passmore *Human Nutrition and Dietetics*. Churchill Livingstone
4. Pike, R. L., Brown, M. L. (1984) *Nutrition – An integrated approach*. Canada : John Wiley and Sons.
5. Sharma S., (2000). *Human Nutrition and Meal Planning*, Delhi : Jnanda prakashan.

**E-reference :**

1. Nutrient Requirements and Recommended Dietary Allowances for Indian  
A Report of expert group of ICMR 2009  
<http://www.scribd.com/document>

**HSC 505L Advanced Nutrition Lab**

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>

**Syllabus :**

1. Determination of vitamin C status of the subject.
2. Detection of inherited disorders
  - a) Alkaptonuria
  - b) Fructosuria
  - c) Tyrosinosis
3. To practice the technique of anthropometry
4. Biochemical parameters and their relevance to the assessment of nutritional status.
5. Determination of basal metabolic rate
6. Acquainting the students with the methods of estimating nutrition requirements.
7. Orienting the students towards planning diets for metabolic disorders.

## **HSC 544 Food Standards, Safety and Regulations**

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Understand quality standards of raw and processed food
- Understand food packaging law and regulation
- Assess quality of food products

### **Section A**

Introduction to food safety and food standards

Food specifications and food standards for different food products

International and national standards– Mandatory and voluntary

Food laws – national and international

Food marks

### **Section B**

Food quality assurance plan, documentation of records, food product standards, Process control, hygiene, total quality process, HACCP-Process control

Quality control and standards of raw and processed food materials

Quality parameters

Tests for adulterants

### **Section C**

Food Packaging laws and regulation and packing commodity rules, weight and measures

Food integrity and conformance to standards

HACCP system and food safety used in controlling micro biological hazards

### **References:**

1. Gould, W.A. and Gould, R.W. (1988): Total Quality Assurance for the Food Industries, CTI Publications Inc. Baltimore.
2. Lava, K. A and Muller, E. I. : Toxicological aspects of Foods : Elsevier Applied Science, London
3. OECD Documents (1996): Food Safety Evaluation, Organisation for Economic Co-operation and Development Paris.

4. Pomeranz, Y. and Meloan, C.E. (1996): Food Analysis: Theory and Practice, CBS Publishers and Distributor New Delhi
5. Ranganna, S. (1986): Handbook of Analysis and Quality Control for Fruit and Vegetable Products, 2nd edition Tata McGraw Hill Publishing Co. Ltd. New Delhi.
6. Shapton, D.A. and Shapton, N.F (1991): Principles and Practices for the Safe Processing and Foods. Butterworth Heinemann Ltd, Oxford

### **HSC 544L Food Standards, Safety and Regulations Lab**

**Max. Marks : 100**

**L T P C**

**(CA: 40 + ESA: 60)**

**0 0 2 1**

Assessment of purity and quality using appropriate standard tests for following

- Milk and milk products
- Fat and oils
- Water
- Ice cream, fruit juices
- Cereal and cereal products
- Spices, Tea, Coffee
- Canned, dehydrated and frozen products

Microbiological tests to assess the quality and contamination of common food products

### **HSC 524 Nutrition in Diseases and Disorders**

**Max. Marks : 100**

**L T P C**

**(CA: 40 + ESA: 60)**

**4 0 0 4**

#### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Find out causes, clinical manifestation, preventive and therapeutic measure of disabling diseases, malabsorption syndrome and genetic defects
- explain the role of probiotics, prebiotics, functional and nano food for maintaining health
- Counsel patients to take therapeutic measure and diet modifications

**Syllabus :****Section A**

1. Nutrition in Cancer
  - Introduction
  - Dietary components associated with cancer
  - Nutritional care
2. Nutrition in AIDS
  - Introduction
  - Signs and symptoms
  - Transmittal routes
  - Nutritional care
3. Nutritional support in Disabling Disease
  - Rheumatoid arthritis
  - Osteo arthrits

**Section B**

1. Inborn Errors of Metabolism  
Metabolic defect, clinical symptoms and management of -
  - Phenylketonuria
  - Galactosemia
  - Maple syrup urine disease
  - Homocysteineuria
  - Familial hypercholesterolemia
2. Nutritional management of malabsorption syndrome, food intolerance and allergy
3. Metabolism of alchol, nutritional effects metabotism of alchohol and nutritional therapy in chronic alcoholism

**Section C**

1. Prebiotics, probiotics and symbiotics – Probiotics : Definition, types and relevance; Usefulness in gastro intestinal health and other health benefits; development of probiotic products; Prebiotics: Prebiotic ingredients in foods; types of prebiotics and their effects on gut microbes; health benefits of prebiotics; symbiotics.

2. Development of functional foods, use of bioactive compounds in appropriate form with protective substances and activators; Research frontiers in functional foods; delivery of immunomodulators / vaccines through functional foods. Nutrigenomics- concept of personalized diet. Use of nanotechnology in functional food industry.

### References :

1. Antia , F.P. and Abraham, P. (1997). *Clinical Dietetics and Nutrition (4th ed.)*. Delhi : Oxford university press.
2. Bamji , M.S. Rao, P.N. and Reddy, V. (1996). *Text Book of Human Nutrition*, New Delhi : Oxford & IBH Publishing Co, Pvt. Ltd.
3. Davidson , S.R., Pabsamore, J.E. and Truswell, A.S. (1984). *Human Nutrition and Dietetics*. Edinburgh : English Language Book Society and Churchill livingston.
4. Lutz Carroll A. , Mazur Erin E. & Litch Nancy A. (1997). *Nutrition and Diet Therapy,(6th ed.)*. Philadelphia : F.A. Davis Company.
5. Robinson, C.H.(1986).*Normal and Therapeutic Nutrition (17<sup>th</sup> ed.)*. NY: McMillan publishing Company.
6. Sharma, S. (2000). *Human nutrition and Meal planning*. New Delhi : Nanda Prakashan.
7. Shils, M.E., Olson, J.A. Shike. and Ross, A.C. (1999). *Modern Nutrition in Health and Disease,( 9<sup>th</sup> ed.)*. Maryland : Williams & Wilkins.
8. Wardlaw, C. M. and Insel, P.M. (1993) .*Perspectives in Nutrition. (2nd ed.)* St. Louis US : Mosby College Publishing.
9. Williams, S.R. (1989). *Nutrition and Diet Therapy. (6<sup>th</sup> ed.)*. St. Louis US : Time Mirror / Mosby College Publishing.

### E- resources :

- History, Nutraceuticals, Mechanism, products and application  
<https://www.slideshare.net/drswaroopsoumya/prebiotics-and-probiotics-40275016>
- Different kinds of probiotics, sources and side effects  
<https://www.slideshare.net/151212345/prebiotic-and-probiotic>
- Inborn errors of metabolism  
<https://www.slideshare.net/Sreevarshinim/inborn-errors-of-metabolism-ppt>



## HSC 524L Nutrition in Diseases and Disorders Lab

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**0 0 2 1**

**Syllabus :**

1. Dietary management in AIDS and Cancer
2. Dietary management of metabolic disorders and food allergies
3. Dietary management in arthritis
4. Dietary management of inborn errors of metabolism

## Fourth Semester

### HSC 523 Nutrition for Health and Fitness

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**4 0 0 4**

**Learning Outcomes:**

On successful completion of the course students will be able to:

- Explain the components of health and fitness and the role of nutrition
- Explain the role of sports nutrition for the enhancement of performance
- evaluate and make recommendations to maintain the fitness and well being of an individual

**Syllabus :**

#### Section A

1. Introduction to fitness, wellness and lifestyle management. Basic principles of physical fitness. Definition, components and assessment criteria of age – specific fitness and health.
2. Holistic approach to the management of fitness and health:
  - Energy input and out put
  - Diet and Exercise
  - Effect of specific nutrients on work performance and physical fitness.
3. Nutrition, exercise, physical fitness and health inter-relationship

## Section B

Dietary supplements and ergogenic aids

1. Nutrition in sports: Sports specific requirements Diet manipulation pre and post game meal. Diet for person with high energy requirements, stress, fracture and injury.
2. Water and electrolyte balance: Loss and their replenishment during exercise, effect of dehydration, sports drinks.
3. Effect of work environment on health, safety, and performance adaptive responses
  - (i) Physical factors-heat, cold, noise, vibration and light.
  - (ii) Nutritional factors (water, electrolyte, energy, foods, protein, vitamin, essential trace minerals),
  - (iii) Environmental contaminants (dust, gases, fumes, chemical)

## Section C

1. Significance of physical fitness and nutrition in the prevention and management of -
  - Weight
  - Diabetes mellitus
  - Cardiovascular disorders
2. Nutrition and exercise regimes for pre and post natal fitness
3. Alternative systems for health and fitness like ayurveda, yoga, meditation, vegetarianism and traditional diets

### References:

1. Wolinsky Ira (Ed.)(1997). *Nutrition in Exercise and sports( 3<sup>rd</sup> ed.)*. Florida : CRC Press
2. Mahan, L.K. & Eccohstum P.S. (2000). *Krause's Food , Nutrition and Diet therapy (10<sup>th</sup> ed.)*. W.B. Saunders Ltd.
3. MCArkle, W. Katch . F. and Katch, V. (2014). *Exercise Physiology Energy, Nutrition and Human Performance ( 8th ed.)*. Philadelphia : Williams and Wilkins.
4. Parizkova, J.( Ed. ). (2017). *Nutrition, Physical Activity and Health in Early Life*. Florida : CRC Press.

5. Ross, A.C., Caballero, B., Cousins, R. J., Tucker, K. L., and Ziegler, T. R. (2014). *Modern Nutrition in Health and Disease (11<sup>th</sup> ed.)*. Philadelphia : Williams and Wilkins.
- 6.Sizer F. and Whitney , E. (2000). *Nutrition – concepts and controversies (8<sup>th</sup> ed.)*. Belmont, CA: Wadsworth, Thomson Learning.
7. Whitney E.N. & Rolfes S.R. (1999). *Understanding Nutrition (8<sup>th</sup> ed.)*. Belmont, CA: Wadsworth, Thomson Learning.

#### **Journals :**

1. *Medicine and Science in sports and Exercise*
2. *International Journal of Sport Nutrition*

#### **E- resources :**

- Carbohydrate loading, fueling exercise, Pre and post workout meal, hydration  
[www.slideshare.net/MUSWellness/sports-exercise-nutrition](http://www.slideshare.net/MUSWellness/sports-exercise-nutrition)
- Benefits, Principles, Pre and post workout meals  
<https://www.slideshare.net/fitnesslex/sports-nutrition-38663048>
- Nutrients in sports nutrition  
<https://www.slideshare.net/BODYFUELZBIO/basics-on-sports-nutrition>

### **HSC 523L Nutrition for Health and Fitness Lab**

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>

#### **Syllabus :**

1. Assessment of nutritional status and Physical fitness
  - Height, weight, BMI
  - Mid Upper arm circumference
  - Skin fold thicknesses
  - WHR
2. Diet survey and diet calculations

## HSC 530 Techniques and Instrumentation in Nutrition Research

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

### Learning Outcomes:

On successful completion of the course students will be able to:

- Familiarized with instruments and techniques used in Food Science and Nutrition Research
- Skilled to analyze macro and micro nutrients of food stuffs with precision and accuracy

### Syllabus :

#### Section A

1. Electrolytic dissociation in acids, bases and salts, Buffers used in nutritional and biochemical analysis, Concept of buffer action, Hendersen – Hasselbech equation and its application in buffer preparation, Theory of indicators and principle of measurement of pH by indicators /pH papers
2. Physico-chemical principles involved in visible and UV spectrophotometry, Construction and working of colourimeter and UV spectrophotometer
3. Physico- chemical principles involved in atomic absorptiometry, flourimetry, flame photometry and pH measurement, construction and working of these instruments. Application of these techniques

#### Section C

1. Principles and brief description of the working and applications of radio immuno assay (RIA) and enzyme linked immuno sorbent assay (ELISA) techniques
2. Overview of the principles and applications of biological and microbiological assays.
3. Animal experimentation : Albino rats as experimental animals, their nutritional/dietary requirements , housing and care, formulation of diets, Feeding practices, Anaesthesia, Blood sampling techniques, Euthanasia and organ sampling, Designing animal experiments

**References :**

1. Keith Wilson and John Walker(Ed.). (2005). *Practical Biochemistry Principles and Techniques*. New Delhi : Cambridge low priced edition.
2. Lab Manual in Biochemistry (2012). New Jersey : Wiley Eastern limited.
3. Raghuramulu et al (2010). *A Manual of Laboratory Techniques*. Hyderabad : National Institute of Nutrition.
4. Sharma S. (2007). *Experimental Techniques in Biochemistry*. Delhi : Galgotia publishers.

## **HSC 530L Techniques and Instrumentation in Nutrition Research Lab**

**Max. Marks : 100****(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>

**Syllabus :**

1. Standardization of a colourimetric and spectrophotometric method and working on this instrument
2. Standardization of a fluorimetric method and working on this instrument
3. Semi automatic protein estimation by Kjehldal nitrogen quantitation
4. Separation of the various components of a mixture using a suitable chromatographic method
5. Dietary fibre estimation by Pelican semi automatic apparatus

## **Specialization I : Food Processing**

### **HSC 515 Food Processing and Technology**

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**4 0 0 4**

#### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Describe the source and variability of raw food material and their impact on food processing operations
- Explain the principles and current practices of processing techniques and the effects of processing parameters on product quality
- Describe the unit operations required to produce a given food product
- Explain the properties and uses of various packaging materials
- Describe the transport processes and the unit operations in food processing as demonstrated both conceptually and in practical laboratory settings

#### **Syllabus :**

##### **Section A**

1. Principles underlying food preservation operations
  - (i) Thermal
  - (ii) Refrigeration and freezing
  - (iii) Dehydration
  - (iv) Radiation
2. Processing Technology of foods:
  - (i) Cereals: Wheat milling process, baking technology, production of bread, barley malting, Rice processing, fractionation, Parboiled Rice
  - (ii) Beverages: Manufacturing process of Beer, Wines, Liquors and high fructose corn syrup.

##### **Section B**

1. Nuts and oilseeds: Pressing, Solvent Extraction, Purification (degumming, refining, bleaching, deodorization), hydrogenation, plasticizing and tempering.

2. a) Fruits and vegetables: changes during ripening.  
b) Canning process of fruits and vegetables.
3. a) Milk and Milk products: Milk processing, separation and standardization, pasteurization, homogenization, ultra high sterile milk.  
b) Milk products: Skimmed milk, Fortified milk, Butter, Cheese, dehydrated milk products.

### **Section C**

1. Meat and Fish Processing
  - Rigor Mortis and its role
  - Ageing
  - Tenderizing
  - Curing
  - Smoking
  - Salting
  - Pickling
  - Storage of Egg, meat and Fish
2. Fortification Technology:
  - Objectives
  - Nutritional significance
  - Selection of vehicle
  - Fortification of salt, Cereal products and dairy products.
3. Extruded food: An Introduction to Extrusion Technology
4. An Introduction to packaging Technology
  - objectives
  - Basic Packaging Materials and their protective qualities
  - Effect of packaging on the nutritive value of foods

### **References :**

1. Dey, S.(1996). *Outlines of Dairy Technology*, Delhi : Oxford University Press,
2. Desrosier,N.W(1977). *Elements of Food Technology*. Connecticut: USA :AVI publishing Co.

3. Fellows, P.J. (2008). *Food Processing Technology: Principles and practice* (2<sup>nd</sup> ed.). Cambridge : CRC Woodhead publishing LTd,
4. Gould, G.W. (1994). *New Methods of Food Preservation* . London: Blackie Academic and Professional.
5. Matz, S.A. (1970). *Cereal Technology*. Connecticut, USA: AVI Publishing Co.
6. Tressler, D. K. & Joslyn, M. A. (1961). *Fruit and Vegetable Juice Production*. Connecticut, USA: AVI Publishing Co.

### **E resources**

- Food processing and technology  
<https://www.acs.edu.au/courses/food-processing-and-technology-721.aspx>
- Food Science knowledge into Food Chain  
<https://www.iseki-food.net/training/e-learning-Integrating>
- FAO  
<http://www.fao.org/elearning/#/elc/en/home>

## **HSC 516 Food Product Development Safety and Quality Control**

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

L	T	P	C
4	0	0	4

### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Describe the various aspects of product development
- Apply the knowledge of quality assurance in food industries
- Explore sensory and nutritional attributes of new product

### **Syllabus :**

#### **Section A**

1. New food products
  - Definition, classification, characterization, factors shaping new product development
  - Social concerns, health concerns, impact of technology and market place influence



2. A brief introduction to phases in Food Product Development- (with appropriate examples of each phase)
  - Idea generation
  - Screening (feasibility, consumer studies, financial review)
  - Development, production, consumer trials and test market

### **Section B**

3. Refining the screening procedures for the product
  - Sensory Evaluation
  - Shelf life testing
  - Product integrity and conformation to standards and their specialization for
    - (i) Preservatives
    - (ii) Colouring matter
    - (iii) Emulsifying agents
    - (iv) Current concepts of quality control
4. Quality assurance programme
  - Quality assessment plan
  - Documentation of records, product's standards
  - Product and purchase specification
  - Process control and HACCP

### **Section C**

5. Product Evaluation
  - Sampling for product evaluation and line control
  - Statistical quality and process control
  - Sample preparation
  - Reporting results and reliability of analysis
  - Grading and marketing of finished products
6. Tests for specific raw food ingredients and processed products
  - a) Proximate analysis
  - b) Specific Nutrient analysis

### **References :**

1. Early, R. (1995): *Guide to Quality Management Systems for the Food Industry*. London: Blackie. Academic and Professional.

2. Food and Agriculture Organization. (1980). *Manuals of Food Quality Control to Additives Contaminants Techniques*. Rome.
3. Fuller, G.W. (1994). *New Food Product Development from Concepts to Market Place*. New York ,NY: CRC Press
4. Man, C.M.D.,& James, A.A. (1994). *Shelf Life Evaluation of Foods*. London: *Blackie*. Academy and Professional.
5. Nelson, S.S. (1994). *Introduction to Chemical Analysis of Food*. Boston: Jones and Bartlett Publishers.
6. Ranganna, S.S. (1994): *Handbook of Analysis and Quality Control for Fruits and Vegetable Products*. New Delhi: Tata McGraw Hill Publishing Co Ltd.

#### **E - Resources:**

- Sensory evaluation in food industry  
[http://eta.bibl.u-szeged.hu/731/1/sensory\\_evaluation\\_in\\_food\\_teljes.pdf](http://eta.bibl.u-szeged.hu/731/1/sensory_evaluation_in_food_teljes.pdf)
- Quality Control A Model Program for the Food Industry  
<https://athenaeum.libs.uga.edu/bitstream/handle/10724/12251/B997.pdf?sequence=1>
- Food Quality Assurance  
<http://www.thanut-swu.com/images/BOT331/food%20quality%20assurance.pdf>

### **HSC 535L Food Processing and Quality Assurance Lab**

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

#### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Design and develop new food products for human consumption
- Evaluate sensory and nutritional attributes of new product
- Appreciate the effect of processing upon the nutritional properties of foodstuffs

#### **Syllabus :**

1. To study the time and water required for sprouting whole pulses and legumes.

2. To prepare Amylase rich Foods (ARF) from cereals and to develop energy dense food products from it.
3. To demonstrate the method of preparing Peanut Butter.
4. To test the Acceptability of texturized food products as an alternative to meat.
5. To prepare simple Extruded food products.
6. Quality Assurance ,testing of wheat flour.
  - Alcohol acidity
  - Gluten.
7. Quality Assurance of Bread
  - pH of Bread extract
  - Acid insoluble ash
  - Crude fibre
  - Total solid content.
8. To improvise products by evolving on the traditional ones and their sensory evaluation.
9. Qualitative evaluation of some common food additives.
  - Sulphur dioxide
  - sodium benzoate
  - Colours Extraction
  - Identification of food colours (annatto, Chlorophyll, caramel, turmeric)

## **Specialization II :Therapeutic Nutrition**

### **HSC 509 Clinical Nutrition and Dietetics**

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

L	T	P	C
4	0	0	4

#### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Skilled in the methods of assessment of nutritional status of the patients
- Able to be employed as dietician in hospitals and other health organizations
- Able to conduct the researchers in the field of therapeutic nutrition
- Prepared to work as independent dietician and dietary counselors
- Ready to run therapeutic kitchens and increases their employability in such kitchens

#### **Syllabus :**

##### **Section A**

1. Nutritional assessment of hospital patients
  - Methods based on single index
  - Prognostic nutritional index
  - Mini nutritional assessment
  - Nutritional risk index
  - Hospital prognostic index
  - Cluster analysis
  - Subjective global assessment
2. Drug nutrient interaction
  - Drug effect on food and nutrition
  - Food and nutrient effect on drugs

##### **Section B**

Recent advances in the dietary management of –

1. Gastro intestinal diseases
  - Peptic ulcer
  - Ulcerative colitis

- Diarrhoea
- Dysentery
- 2. Liver disorders
  - Viral hepatitis
  - Cirrhosis
  - Hepatic coma
- 3. Gall bladder and pancreatic disorders
  - Cholelithiasis
  - Pancreatitis

### Section C

Recent advances in the dietary management of –

1. Renal disorders
  - Acute nephritis
  - Nephrotic syndrome
2. Eating disorders
  - Anorexia nervosa
  - Bulimia nervosa
4. Infection

### References :

1. Bendich, A., *Deckelbaum, R.J.*(Eds.) (2001). *Primary and Secondary Preventive Nutrition*. Totowa NJ : Humana Press.
2. Mahan, K. L., Escott–Stumps, S. (2000). *Krause's Food, Nutrition and Diet Therapy*. Philadelphia USA : W. B. Saunders.
3. Shils, M.E., Olson, J. A., Shike, M., Ross, A. C.(1999). *Modern Nutrition in Health and Disease*. Bombay: KM Varghese Company.
4. Williams, S.R. (1997). *Nutrition and Diet Therapy*. St. Louis: Times Mirror/ Mosby Publishing

## HSC 522 Nutrition and Critical Care

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

### Learning Outcomes:

On successful completion of the course students will be able to:

- understand the nuances of nutrition care process in ICUs
- deeply know the "Medical nutrition therapy" (MNT) for life threatening prevalent diseases and disorders
- use evidence based practice in hospital settings
- Skilled to plan therapeutic diet for different types of diseases

### Syllabus :

#### Section A

1. Definition and process of nutritional care, nutritional screening and counseling.
2. Enteral Nutrition – Introduction, advantages of enteral feeding, indication and selection of enteral feeding, Enteral feeding methods (gastric or transpyloric tube feeding), Techniques of tube placements: complication of tube feeding, measures of monitoring of EN.
3. Parenteral Nutrition- Introduction, indications of Parenteral Nutrition, components and requirements for PN solution , delivery and monitoring for PN, complications of PN (technical, metabolic and infective )
4. Hospice Nutrition

#### Section B

1. Role of immuno-enhancer, immune suppressants and special diet in critical care
2. Diet related ethical issues in the terminally ill
3. Diet and metabolic aspects and special nutritional requirement in ESRD and multiple organ dysfunction syndrome

### Section C

Clinical and metabolic aspects and special nutritional requirements in following conditions -

- Stress, trauma, sepsis, burns
- C.V. complication and surgery
- Kidney transplant, dialysis
- Hepatic failure and transplant
- GI tract surgery
- Diabetic complications
- Neurosurgery

### References :

1. Ghai, O.P and Gupta P. (1994). *Essential Preventive medicine; Clinical and applied orientation*. NOIDA (UP) : Vikas Publishing House Pvt.Ltd.
2. Gupte S. (Ed.). (2006). *Textbook of Pediatric Nutrition*. Delhi: Peepee Publishers and Distributors (P) Ltd.
3. Mahan L.K. and Escott Stump S. (Eds.) (2000). *Krause's Food, Nutrition & Diet Therapy*.USA: Saunders.
4. Phillips, G.D. & lodgers. C.L. (1986) *Parenteral and Enteral Nutrition A Practical guide*. London : Churchill, Livingstone
5. Shils, M.E. , Oslan, J.A., Shike, M. & Ross, A.C. (1999): *Modern Nutrition in Health and Disease (9<sup>th</sup> ed.)*. Philadelphia: William and Wilkins.
6. Srilakshmi B. (2011). *Dietetics*. New Delhi: New Age International (P) Limited, Publishers.
7. Williams S.R. (2007). *Nutrition and Diet Therapy*. St. Louis: Times Mirror/Mosby College Publishing.
8. Zaloga, G.P (1994) *Nutrition in critical care*. T St. Louis: imes Mirror/ Mosby.

## HSC 538L Therapeutic Nutrition Lab

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

### Learning Outcomes:

On successful completion of the course students will be able to:

- Prepare a safe and nutritious general (house) tube feed for home based patients
- Plan and to prepare therapeutic diet for different types of diseases
- Suggest suitable nutritional supplements for specific health conditions

### Syllabus :

1. Planning of diets using exchange list for -
  - Peptic ulcer
  - Ulcerative colitis
  - Viral hepatitis
  - Cirrhosis
  - Cholelithiasis
  - Acute nephritis
  - Nephritic syndrome
  - Infection (acute fever)
2. Preparation and service of these diets
3. Preparation of aids for dietary counseling
4. Market survey of commercial nutritional supplements
  - a) Collection of information on commercial food formula available in the market and their evaluation
  - b) Intravenous nutrition supplement (TPN)- (cost, composition, dosage, indications and contra – indications)
5. Preparation of blenderised formulae for enteral feeding – Standard tube feed formula, High calorie high protein tube feed formula, Diabetic feeds, Renal feeds, Hepatic feed



# Clothing and Textile

## First Semester

### HSC 404 Apparel Pattern Making

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**4 0 0 4**

#### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Acquire basic skills and knowledge to make paper patterns by different methods
- Develop an understanding of sizing systems and pattern grading techniques used in garment industry
- Create designs for apparels using construction details applying elements of arts and principles of designs
- Produce paper patterns of different designs in different sizes

#### **Syllabus:**

#### **Section – A**

1. Methods of pattern making

(a) Drafting (b) Flat Pattern (c) Draping

Their principles, applications and limitations in clothing construction

2. Types of block patterns – standard, simplified, tailored, trade, primary and secondary blocks, blocks for knitted fabric, commercial pattern

#### **Section – B**

1. Anthropometric measurements and their values
2. Body proportion, figure types and sizes
3. Measurement for men's tailored garments, method of measuring female figure for different garments
4. Techniques of grading block
5. Pattern envelope – front, back, pattern marking, pattern guide sheet
6. Clothing terminology

#### **Section – C**

2. Scope of dress and apparel design

3. Roles and responsibilities of designer
4. Types of design – structural and decorative
5. Use of construction features in design – seams, tucks, pleat, gather, neckline, hem opening, fastners, sleeve, collar, wristband, cuff
6. Elements of arts and principles of design and their application on apparel
7. Design & fabric selection in relation to figure, fashion, climate, occasion, complexion

#### **References :**

1. Erwin, and Kinchen (1979). *Clothing for Modern*. New York: MacMillan and Co.
2. Kallal (1995). *Clothing Construction*. New York: Macmillan Publishing Company.
3. *Reader's Digest complete Guide to Sewing*. (1979). London: The Readers Digest Association Ltd.
4. Winfred, A. (1996). *Fabric Form and Flat Pattern Cutting*. New Delhi: Om Books Service.

### **HSC 404L Apparel Pattern Making Lab**

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

#### **Syllabus :**

- (1) Designing through flat pattern
  - Dart Manipulation in bodice
  - Dart Manipulation in skirt
- (2) Development of variation in
  - Basic sleeves
  - Collars
  - Neckline
  - Opening

## HSC 411 Historic Costumes

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**4 0 0 4**

### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Learn to identify the causes for origin of clothing with respect of various theories involved.
- Become well acquainted with evolution of different details of costumes in different era and traditional forms of costumes prevailing in various countries and at different parts of same country Develop appreciation of the tradition and heritage of the past clothing.
- Get inspiration from historic silhouettes and designs for the present and future styles of clothing.
- Analyze design sketch, adapt and translate it into product

### **Syllabus :**

#### **Section A**

1. Origin of clothing
2. Theories of clothing – theory of modesty, immodesty, protection, adornment, combined need theory
3. Costume of ancient civilizations – Egypt, Greece and Rome

#### **Section B**

1. English costumes during middle ages.
2. French costumes from Renaissance to 20<sup>th</sup> century

#### **Section C**

1. Indian costumes- Historical approach from ancient period to British period
2. Study of regional costumes of India
  - a) Northern, western, eastern, central, southern
  - b) South – central, west – central, south – eastern, south – western regions.
3. Study of Indian sarees of past and present

**References :**

1. Albert, R. (1995). *Historical Encyclopedia of Costumes*. England, UK: Studio.
2. Bhushan, J.B. (5<sup>th</sup>ed.). (1958). *Costumes and Textiles of India*. Mumbai : D B Taraporevala Sons & Co. Pvt. Ltd.
3. Black, J.A. & Garland, M. (1990). *A History of Fashion*. London: Orbis Publishing Ltd.
4. Cumming, V., Cunnington, C.W., & Cummington, P.E. (2010). *The Dictionary of Fashion History*. London: Oxford International Publishers Ltd.
5. Dar, S.N. (1983 ). *Costumes of India and Pakistan: A Historical and Cultural study*. Mumbai, IN: Advent Books division.
6. Ghurye, G.S. ( 2<sup>nd</sup>ed.). (1966). *Indian Costumes*. Mumbai: Popular Prakashan.
7. Horn, M.J. & Gurel, L.M. (6<sup>th</sup>ed.). (1983). *The Second Skin: an interdisciplinary study of clothing*. Boston: Houghton Mifflin Co.
8. Lyndon, L. (2002). *The Sari: Styles Patterns History Techniques*. London: Thames & Hudson Inc.
9. Peacock, J. (1994). *Costumes 1066 -1990s*. London: Thames & Hudson Ltd.
10. Roshan, A. (1983). *Ancient Indian Costumes*. New Delhi: Art Heritage.
11. Tortora, P.G. & Eubank, K. (Both ed.). (2009). *Survey of Historic Costume*. New York: Fairchild Books Inc.

**HSC 416 Research Methods in Clothing and Textile****Max. Marks : 100****(CA: 40 + ESA: 60)****L T P C****4 0 0 4****Learning Outcomes:**

On successful completion of the course students will be able to:

- Explain meaning , importance, types of research and methods of data collection
- Outline research proposal
- Write research report

**Syllabus :****Section A**

1. Research - meaning and importance, nature and areas of research in clothing and textiles.
2. Types of Research
  - a) Pure, applied and action
  - b) Longitudinal vs cross sectional approach
  - c) Quantitative - descriptive, correlational, causal comparative, experimental research
  - d) Qualitative - historical, explanatory
3. Planning Research Design
  - a) Meaning, functions, characteristics of good research design.
  - b) Phases in research designs
  - c) Design for different types of research
  - d) Outlining a research proposal - Introduction, review of literature, significance of study, operational definition of terms and concepts, delimitations of study, basic assumptions/hypothesis Sampling tools and procedure for collecting data, bibliography, time and budget schedule

**Section B**

1. Research problem:- sources, criteria, statement and operational definition
2. Review of literature – Importance, sources of literature collection and presentation
3. Variables & their types, formulating objectives
4. Hypothesis – meaning, importance, ways of stating
5. Sampling – meaning, importance, sampling techniques, sources of bias and methods of reducing bias

**Section C****Methods & devices of data collection :**

1. a) Survey, observation, interview, questionnaire, case study, check list, rating scale, field studies.
- b) Psychometrics : meaning & characteristics of a good test, determination of reliability, validity, discrimination power

2. Data Analysis:- Classification, coding and analysis, interpretation of data.
3. Research Report :
  - (i) General structure of reporting.
  - (ii) Formal style of writing
    - Acknowledgement
    - Tables & figures
    - Footnotes, Quotations
    - Appendices, Bibliography
    - Writing for publication

### References:

1. Agarwal, J.C. (1966). *Educational Research. An Introduction*. New Delhi: Arya Book Depot.
2. Bhatnagar, G.L. (1990). *Research Methods and Measurement in Behavioural and Social Sciences*. New Delhi: Coll Publishing Academy.
3. Ghosh, B.N. (1986). *Dictionary of Research Methods*. Delhi: Arnol Heinmann.
4. Kothari, C.R. (2004). *Research Methodology: Methods and Techniques*. New Delhi: New age International.
5. Nachmias, D. & Nachmias, C. (1981). *Research methods in Social Sciences* (2<sup>nd</sup> ed.). New York: St Martin's Press.

### E-Resources:

- Research methodology, methods and techniques, CR Kothari  
<http://www.modares.ac.ir/uploads/Agr.Oth.Lib.17.pdf>
- Research hypothesis – Slide share  
<https://www.slideshare.net/drjayeshpatidar/research-hypothesis-20719840>

## HSC 425 Textile Chemistry

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

L	T	P	C
4	0	0	4

### Learning Outcomes:

On successful completion of the course students will be able to:

- Explain the fundamental principles of polymer science
- Interpret chemistry, production and fundamental properties of natural and man-made fibers
- Explain diverse global community and ecology within their physical, biological and social dimensions
- Make informed judgments on softening of water, desizing, scouring, bleaching and starching of textile substrate

### Syllabus :

#### Section A

1. Polymer chemistry
  - a) Polymers, methods of polymerization, polymerization process
  - b) Definition of copolymer, oligomer, graft copolymer
  - c) Degree of polymerization, molecular weight of polymer and its determination
  - d) Characterization of polymer using chemical and instrumental methods
  - e) Orientation and crystallinity of polymer, intermolecular forces, their influence on fiber properties
2. Chemistry of cellulosic fibers
  - a) Chemical composition, morphology, molecular structure, physical and chemical properties
  - b) Regenerated cellulosic fibers – viscose, cupramonium, polynosic rayon, cellulose acetate. Their manufacture, properties and uses
3. Chemistry of protein fibers- wool and silk
  - a) Chemical composition, morphology, molecular structure, physical and chemical properties
  - b) Brief description of felting in wool, degumming and weighting of silk

### Section B

1. Chemistry of synthetic fibers – polyester, polyamide, acrylonitrile  
Their chemistry, raw material, manufacturing process from polymer to fiber stage. Physical and chemical properties of all the fibers
2. Other natural and man made fibers: Jute, flex, hemp, specialty wool fibers, polyurethane etc
3. Blends of different fibers, composition, properties and uses in textile and clothing

### Section C

1. Scientific basis of scouring and bleaching of textile fibers and fabrics
  - a) Water (Hard and soft)
  - b) Use of surface active compounds in scouring
  - c) Role of soap and detergents as scouring agents
  - d) Chemistry and methods of application of bleaching agents to various textiles
2. Starch and starching –chemical structure and application of stiffening agents
3. Optical brighteners – chemical nature and methods of application to various natural and man made fibers

### References:

1. Gohl & Vilensky (1977). *Textiles for Modern Living*. Australia: Longman Cheshire. Charles Griffin & Co. Ltd.
2. Marsh, J.T. (1979). *Textiles Science*. Mumbai: B.I. Publications.
3. Marsh, J.T. (1979). *An Introduction to Textile Bleaching*. Mumbai: B.I. Publications.
4. Sadv, F.K., M. Matetskyy, A. (1978). *Chemical Technology of fibrous material* Moscow: M.R. Publishers.
5. Trotman, E.R. (1964). *Textile Scouring and Bleaching*. England: Charles Griffin & Co. Ltd.
6. Shenai, V.A. (1995). *Textile Fibers*. Mumbai: Sevak Publications.
7. Trotman, F.R. (1964). *Dyeing and Chemical Technology of Textile fibers*. England: Charles Griffin & Company Ltd.

### E-References:

- A comparative study on the application of optical brightening agent on cotton knitted fabric in one bath and two bath exhaust method.  
<http://article.sapub.org/10.5923.j.textile.20170605.03.html>



- Bleaching in textile industry  
[http://wiki.zero-emissions.at/index.php?title=Bleaching\\_in\\_textile\\_industry](http://wiki.zero-emissions.at/index.php?title=Bleaching_in_textile_industry)
- Classification of polymers  
<http://www.toppr.com/bytes/classification-of-polymers/>
- Textile bleaching process  
<http://textilefashionstudy.com/textile-bleaching-process-definition-objectives-process-parameters-of-bleaching/>
- Textile fibre and their characteristics  
<https://jamesdunloptextiles.com/design-news/an-educational-yarn/textile-fibres>
- Technical properties of cotton fibre  
<http://textilelearner.blogspot.com/2015/11/technical-properties-of-cotton-fiber.html>
- Water hardness/problem caused by hard water in wet processing/dyeing industry.  
<http://textilelearner.blogspot.com/2012/10/water-hardness-problem-caused-by-hard.html>
- Cleansing agents: soaps and detergents  
<https://hemantmore.org.in/foundation/science/chemistry/soaps-detergent/2235/>

### HSC 425L Textile Chemistry Lab

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

L	T	P	C
0	0	4	2

#### Syllabus:

1. Identification tests for blends
2. Desizing, scouring and bleaching of textile material
3. Determination of strength of bleach liquor
4. Determination of hardness of water
5. Softening of water with various methods
6. Determination of alkalinity in soap solution
7. Determination of effectiveness of soaps and detergents
8. Formation and detection of oxycellulose, copper number of oxidized cotton

## Second Semester

### HSC 408 Fashion Business and Communication

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**4 0 0 4**

#### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Explore dynamics of fashion , its development and role of fashion designers
- Gain understanding of fashion business fashion communication
- Describe managerial aspects of fashion retailing
- Illustrate fashion figures, garment details, accessories and theme rendering
- Develop fashion line using elements of art and design

#### **Syllabus :**

#### **Section A**

The Dynamics of fashion; an overview

1. Fashion terminology, fashion cycle, principles of fashion adoption, theories of fashion adoption, psychology of fashion, factors affecting fashion and its changes. History of fashion
2. Fashion forecasting, sources of fashion information. The role of designers in merchandising
3. Components of fashion: silhouette, detail, texture, color, fabric, seams and trims
4. Research and design development: An advance approach
  - a) Elements & principle of art & design
  - b) Interpreting theme /trend
  - c) Scope of line
  - d) Line portfolio
  - e) Designers case study (National & International)

#### **Section B**

Fashion Retailing & Business:

1. The definition and concept of retailing, role of retailing in merchandising, retail environment, types of retail stores, expansion of retailing in 20<sup>th</sup> century

2. The retail mix, planning and budgeting for a retail store, maintenance and ordering of stocks, preparation of sales reports
3. Segments /categories of fashion Industry – An overview
  - a) Primary level
  - b) Secondary level

### **Section C**

Fashion communication:

1. Need for promotion of fashion, need for the communication process, and communication through media
2. Brief overview about written communication, fashion shows in practice or choreography of fashion events
3. Visual communication:
  - a) Plans and schedule – seasons, holding promotion, sales themes / ideas
  - b) Types of displays – Window display, Interior displays
  - c) Elements of display – The merchandise, the backdrop, wall & shelves, mannequins and forms, signage lightings – illuminance levels, relation to colors

### **References:**

1. Abing, B. (1993). *Fashion Sketchbook*. New York: Fairchild publication.
2. Abing, B. (2017). *Fashion Flats and Technical Drawing*. New York: Bloomsbury Publication.
3. Aldrich, W. (1966). *Fabric form and flat pattern cutting*. London: Blackwell.
4. Castelino, M. (1994). *Fashion Kaleidoscope*. Calcutta: Rupa and co.
5. Clark, J. (2015). *Fashion Merchandising: Theory and Practice*. London: Palgrave.
6. Frings, G. S. (1999). *Fashion from Concept to Consumer*. New Jersey: Prentic Hall
7. Ireland, P.J. (2005). *Figure Templates for Fashion Illustration*, Singapore: Page One Publishing Pvt.Ltd.

8. Leach, R. (2012). *The Fashion Resource Book: Research for Design*. London: Thames and Hudson
9. Seivewright, S. (2017). *Research and Design for Fashion*. London: Bloomsbury Publication
10. Stone, E. (2004). *The Dynamics of Fashion*. New York: McGraw Hill Book Company

#### **E-Resources:**

- Fashion cycle, adoption of fashion – slide share  
<https://www.slideshare.net/Tamilselvan245/fashion-cycle-adaption-of-fashion>
- Innovative approaches in fashion retailing,  
[https://www.researchgate.net/publication/322291991\\_Innovative\\_Approaches\\_In\\_Fashion\\_Retailing](https://www.researchgate.net/publication/322291991_Innovative_Approaches_In_Fashion_Retailing)

### **HSC 408L Fashion Business and Communication Lab**

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**0 0 4 2**

#### **Syllabus:**

1. Fashion figure proportion:
  - a) Sketching of different croqui (front, back & side view) for child, male & female
  - b) Basic figure forms; drawing legs, arms, feet, hand in different form and motion
  - c) Fashion heads; drawing head in different angle & sketching features, sketching hair style
  - d) Model drawing: gesture components & sketching different poses
2. Sketching garment & garment details using gravity, angles, & perspective  
neckline, collars, sleeve details, skirts, Pants, blouse, blazer, jacket, coats, ruffles, cascades, cowls, smocking and shirring & draping details
3. Sketching Accessories:  
hats, headgear, footwear, sunglasses, bags & purses, jewellery

4. Basic rendering techniques:
  - a) Color matching using different media
  - b) Pattern and texture – checks, stripes, plaids & gingham, fabric prints
  - c) Reducing the print
5. Development fashion line / range of garment (with accessory) using elements of art & design. texture color, details, shape & structure
6. Theme Rendering
  - a) Casual wear
  - b) Sports wear
  - c) Executive wear/ Formal wear
  - d) Night wear
  - e) Bridal wear
  - f) Beach wear
  - g) Traditional wear/ Ethnic wear
  - h) Party wear

## **HSC 410 Garment Production Technology**

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Explain functions of different sections of garment production unit
- Define and explain the principles and methods of making and joining various garment parts
- Extend and expand ideas about materials and technologies available for apparel industry so as to further develop their creativity and critical thinking
- Examine and evaluate the quality of apparels during production

### **Syllabus:**

#### **Section A**

1. Introduction to the background and structure of the garment industry
2. The organization of a garment factory – various departments like design, marketing, finance, purchasing, production and operation
3. Review of fundamental aspects of garment designing (Pattern making)

## Section B

Manufacturing technology -

1. Cutting and cutting room
2. Fusing technology
3. Sewing technology
4. Pressing technology
5. Production technology
6. Warehousing

## Section C

Quality assurance in garment manufacturing - inspection and its significance, Raw material inspection, In process inspection, Final Inspection and A QL, Statistical Quality Control

### References :-

1. Carr, H. & Latham, B. (1994). *The Technology of Clothing Manufacture* (2<sup>nd</sup> ed.). Oxford, UK: Blackwell Science Ltd.
2. Cooklin, G. (1991). *Introduction to Clothing Manufacture*. Oxford, UK: Blackwell Science Ltd.
3. Cooklin, G. (1997). *Garment Technology for Fashion Designers*. Oxford, UK: Blackwell Science Ltd.
4. Glock, R. E. & Kunz, G. I. (2005). *Apparel manufacturing: sewn product analysis*. New Delhi, India: Pearson Education, Inc.
5. Naseer, M. (2007). *Pocket Apparel expert: a practical handbook on garment manufacturing*. Lahore, Pakistan: Irfan Ahmed Shaikh.
6. Rosenau, J. A. & Wilson, D. L. (2014). *Apparel merchandising: the line starts here* (3<sup>rd</sup> ed.). New York, NY: Fairchild books.

### E-Resources:

- Fabric cutting Knives  
<https://www.textileschool.com/464/fabric-cutting-techniques/>
- An overview of quality in textile industry  
<http://textilelearner.blogspot.com/2013/05/an-overview-of-quality-and-quality.html>
- Garment manufacturing quality control  
<https://www.scribd.com/doc/134452607/Assignment-on-Garment-Manufacturing-Quality-Control-pdf>

- Quality control system in garment  
<https://textilelearner.blogspot.com/2014/11/quality-control-system-for-apparel.html>
- In line inspection  
[http://www.authorstream.com/Presentation/sanjitsingh58-1520805 -line-inspection/](http://www.authorstream.com/Presentation/sanjitsingh58-1520805-line-inspection/)

## **HSC 412 Historic Textiles**

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

L	T	P	C
4	0	0	4

### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Summarize the differences in regional embroideries, resist dyed textiles and handloom weaving of India
- Classify a specific embroidery style; block printed textiles and hand-woven textile of India and other countries on the basis of colors, motifs, patterns and layout
- Describe the influencing factors for the evolution and development of different Indian traditional textiles
- Develop portfolios of designs of different types of traditional textiles
- Prepare embroidery articles

### **Syllabus:**

#### **Section A**

1. Brief history and development of woven, embroidered and printed textiles in India
2. An overview of shawls, carpets, tapestry, brocades, baluchar butidar, himru, mushru, dacca mulmul, chanderi and Indian ikats

#### **Section B**

1. An overview of painted and mordant dyed textiles – picchwai, pattchitra, madhubani and kalamkari. Block and resist printed textiles of Rajasthan, Gujarat and M.P.

2. An overview of traditional embroideries of India – phulkari, chikankari, kantha, gujarati, kashmiri, kasuti, chamba rumal and manipuri embroidery

### Section C

History of textile fibres, colors and motifs in India, China, Egypt, Peru, Greece, Crete and Mesopotamia

#### References:

1. Chattopadhyay, K. (1975). *Handicrafts of India*, New Delhi: Indian Council for Cultural Relations.
2. Ghosh, G.K. & Ghose, S. (2000). *Indian Textiles*. New Delhi: APH Publishing Corporation.
3. Ghosh, G.K. & Ghose, S. (2000). *Ikat Textiles of India*. New Delhi: APH Publishing Corporation.
4. Gillow, J. (1991). *Traditional Indian Textiles*, London: Thames and Hudson Ltd.
5. Kothari, G. (1995). *Colorful Textiles of Rajasthan*. Jaipur: Jaipur Printers Pvt. Ltd.
6. Mehta, R.J. (1970). *Masterpieces of Indian Textiles*, D.B. Bombay: Taraporewala Sons and Co. Pvt. Ltd.
7. Naik, S.D. (1996). *Traditional Embroideries of India*. New Delhi: APH Publishing Corporation,
8. Sharma, V. (2002). *Fabric treasures of Andhra Pradesh*. New Delhi: Bhartiya Kala Prakashan.

### HSC 412L Historic Textiles Lab

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

#### Syllabus :

1. Preparation of portfolio of designs of different textiles- printed woven and embroidered
2. Preparation of samples of traditional Indian embroideries
3. Preparation of any one embroidery article



## HSC 421 Statistical Methods in Clothing and Textiles

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**4 0 0 4**

### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Gain knowledge and understanding of various statistical methods for analysis and interpretation of qualitative and quantitative data in clothing and textile field
- Critically analyze the rationale used in parametric and non-parametric tests and apply them to draw inferences

### **Syllabus :**

#### **Section A**

1. Statistics: Meaning, importance, limitations. Conceptual understanding of statistical measures, classification and tabulation of data, discrete and continuous variables. Frequency distribution, diagrammatic & graphical presentation of data
2. (i) Measures of central tendency – Arithmetic and Weighted Mean, median, mode, properties, merits, demerits, common uses in research of above measures  
(ii) Measures of variability – range, mean deviation, quartile deviation, standard deviation, coefficient of variation

#### **Section B**

1. The formal and empirical concepts of Probability and the binomial distribution. Properties of Normal Probability Curve and its applications
2. Correlation: Pearson's Coefficient of correlation, rank correlation
3. a) Sampling distribution & the standard error  
b) Parametric & non parametric tests  
c) Elements of testing statistical hypothesis  
d) Formulation of the problem, definition of Type I and Type II errors, levels of significance, degree of freedom  
e) Test of Significance of mean, standard deviation and correlation

### Section C

1. Application of students' t' test for single mean and difference between the means, paired t test.
2. Analysis of variance – One way classification. Two way classification
3. Chi squares – for testing independence of attributes
4. Other non parametric test: Mann Whitney's U test

#### References:

1. Garrett, H.E. & Woodworth (2004). *Statistics in Psychology & Education* (11<sup>th</sup> ed.). Bombay. India: Vakil, Feffer and Simon.
2. Gupta, S.P. (2000). *Statistical Methods*. New Delhi: Sultan Chand & Sons.
3. Mangal, S.K (2002). *Statistics in Psychology and Education*, (2<sup>nd</sup> ed.). New Delhi: Prentice Hall of India.
4. Pagano, R. R. (1990). *Understanding Statistics in Behavioral Sciences*, (3<sup>rd</sup> ed.). New York: West Publishing Company.
5. Wright, S.E. (1986). *Social Science Statistics*. Boston: Allyn and Bacon Inc.

## HSC 426 Textile Testing

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

#### Learning Outcomes:

On successful completion of the course students will be able to:

- Explain and use methods and techniques to analyze textile fiber, yarn and fabric properties for end use performance
- Use different testing equipments, their underlying principles, the international accepted standards, test methods and the language of measurement
- Analyze the discriminatory selection of textiles for specific end uses

#### Syllabus:

### Section A

1. Objectives and importance of textile testing, importance of standards, different types of standards based on established science, introduction to national and international bodies – BIS, ASTM, BS, ISO, AATCC

2. Selection of samples for testing – Random sampling procedures for determination of properties of fibers, yarns and fabrics
3. Standard atmospheric test conditions, various methods to measure relative humidity, moisture content and moisture regain of textiles

### **Section B**

1. Fiber testing - definition, objectives and method of testing staple length, effective length, short fiber percentage, fineness, maturity, strength
2. Yarn Testing – definition, objectives and method of testing count, twist, diameter, crimp, tensile strength and elongation at break, stress-strain curve, elastic recovery, yarn appearance, evenness

### **Section C**

1. Fabric Testing – definition, objectives and method of testing length, width, bow, thread count, weight, thickness, breaking strength, tear strength, bursting strength, abrasion resistance, pilling, shrinkage, stiffness, drapability, crease recovery
2. Colorfastness test – colorfastness to washing, sunlight, crocking, perspiration, dry-cleaning, ironing
3. Thermal properties of textile fabric

### **References:**

2. Booth, J.E. (1976). *Principles of Textile Testing*. London: Newness Butterworths.
3. Grover and Hamby (1960). *Hand book of Textile Testing and Quality Control*. New Delhi: Wiley Eastern Ltd.
4. Trotman, E.R. (1975). *Dyeing and Chemical Technology of Textile Fibers*. London: Charles Griffin and Company Ltd.

### **E-Resources:**

- AATCC TEST Methods, technical manual and standards
- Textile standards  
<https://www.astm.org/Standards/textile-standards.html>
- Textile research associations  
[http://texmin.nic.in/pdf/ar02\\_c13.pdf](http://texmin.nic.in/pdf/ar02_c13.pdf)  
<https://www.aatcc.org/test/methods/>

## HSC 426L Textile Testing Lab

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

L	T	P	C
0	0	4	2

### Syllabus:

1. Moisture relations – use of oven and hygrometer
2. Physical testing of fiber, yarn and fabric
3. Testing of dyed materials colorfastness tests

## HSC 428P Work Experience/Internship

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

L	T	P	C
0	0	4	2

Practical experience in different units of clothing and textile industry is of great relevance and significance. Students will undergo internship training in a textile designing unit apparel manufacturing unit/ textile dyeing and printing unit / apparel export unit/ boutiques/ fashion houses etc. so that they get to understand the existing working practices, conditions and acquire an indepth technical knowhow. Since ‘seeing is believing and doing is understanding’, the experience would be more sound and meaningful.

There will be work experience/Internship of 4-6 weeks of duration during summer vacations after second semester examination.

Every student has to make presentation and submit a report at the beginning of III Semester.

Three components of evaluation

- (i) Appraisal Report by competent authority of the organization in which student completed training (based on regularity, punctuality, ability to work in the team, ability to be sensitive to the client, initiative to organize specific programme). - 30 Marks
- (ii) Report submitted by the student - 30 Marks
- (iii) Oral presentation - 40 Marks

(evaluated by all the staff members and averaged)

## Third Semester

### HSC 504 Advanced Apparel Designing and Construction

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**2 0 0 2**

#### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Create designs and layout for special fabrics
- Handle different types of fabrics which will improve their sewing skill levels
- Gain knowledge about different aspects of fit and apply them to create correct fit in the garment
- Develop an understanding of quality standards for different components of garment
- Develop patterns for complex designs and tailored garments and, construct them

#### **Syllabus :**

#### **Section A**

1. Special considerations in designing and layout of the garment for prints, stripes, checks, pile fabric etc
2. Handling of special fabric while cutting and stitching (deep pile, lace, velvet, chiffon, knits, leather)
3. Supporting fabrics: lining, interlining, interfacing, underlining, their functions and application

#### **Section B**

##### **Fitting**

1. Factors affecting good fit
2. Fitting shell, master pattern and the test garment
3. Basic pattern alterations in length, width, waist, hipline etc
4. Common problems encountered in fitting, remedies of fitting defects

#### **Section C**

Evaluating the quality of apparel - Identifying the components of apparel - fiber content, shaping device, pockets, neckline, hem treatment, decorative details

## References:

1. Aldrich, W. (1996). *Fabric Form and Flat Pattern Cutting*. New Delhi: Om Books Service.
2. Bray, N. (1986). *More Dress Pattern Designing*. Oxford: Blackwell Science Ltd.
3. Bray, N. (1986). *Dress Fitting*. Oxford: Blackwell Science Ltd.
4. Jaffe. (1993). *Draping for Fashion Design*. London: Prentice Hall Ltd.
5. Kallal. (1995). *Clothing Construction*. New York: Macmillan Publishing Company.
6. Lenker, S. (1984). *Vogue Fitting*. New York: Harper and Row Publishers.
7. *Reader's Digest complete Guide to Sewing*. (1979). London: The Readers Digest Association Ltd.
8. Slambler, Sharp and Donnell. (1983). *Evaluating Apparel Quality*. New York: Fairchild Publications.

## HSC 504L Advanced Apparel Designing and Construction Lab

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

### Syllabus :

1. Designing through draping :
  - Basic Bodice (Front and Back)
  - Basic Skirt (Front and Back)
  - Princess Line
  - Cowl Neck
  - Halter
  - Yokes (bodice & skirt)
  - Shift dress
2. Raglan and kimono blocks and interpretation of various styles using these blocks, types of gusset
3. Neckline and collars – coat collar, gent's collar and shawl collar
4. Stitching of garment using different fabric, texture and design
5. Stitching shorts/ trouser/Bermuda, coat/ classic jacket.

## HSC 512 Dyeing and Printing

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

L	T	P	C
4	0	0	4

### Learning Outcomes:

On successful completion of the course students will be able to:

- Thoroughly comprehend the theories of dyeing, the laws of dyeing kinetics, the manufacturing principles of dyeing machinery and the preparation of various classes of dyes
- Apply procedures and control of production, analyze structures, processes and techniques for optimization and quality assurance of dyeing
- Describe the different methods of printing styles and machines used at industrial level.
- Evaluate the technical advantages of each style of printing
- Use the technical competency in dyeing and printing with different dyes on different fabrics
- Find many research possibilities by getting in-depth technical knowledge of dyeing and printing practices at industrial level

### Syllabus:

#### Section A

1. Classification, definition and chemical composition of textile dyes. C.I. constitution number and C.I. generic number
2. Dyeing with natural dyes, synthetic dyes and pigment dyes
3. Dyeing machine for fiber, yarn and fabric
4. Industrial dyeing practices
5. Dyeing auxiliaries and their use
6. Dyeing of blends

#### Section B

1. Introduction of printing. Historical development of printing method
2. Printing paste – thickening agents and auxiliaries for printing and their suitability to various classes of dyes and fibers
3. Preparation of printing paste for different dyes and different fibers

### Section C

1. Styles of printing – direct , dyed, resist , discharge and raised styles
2. Methods of Printing - block, screen, stencil, roller, tie & dye and batik
3. Special printing procedures – polychromatic dyeing , transfer printing, carpet printing
4. Finishing and after treatment of printed goods at cottage and industrial level

#### References:

1. Clark, W. (1971). *Introduction to Printing*. London: Newness Butterworth.
2. Marsh, J.T. (1979). *Textile Science*. Mumbai: Sevak publications.
3. Shehnai, V.A. (1995). *Technology of Dyeing*. Mumbai: Sevak publications
4. Shehnai, V.A. (1995). *Chemistry of Dyes and Principles of Dyeing*. Mumbai: Sevak publications.
5. Trotman, E.R. (1964). *Dyeing and Chemical Technology of Textile Fibres*. England: Charles Griffin and Co. Ltd.

### HSC 512L Dyeing and Printing Lab

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**0 0 8 4**

#### Syllabus:

1. Dyeing of cotton, silk, wool, nylon, polyester, acrylic with corresponding dyes
  - Dyeing of cotton with direct, reactive and vat dyes by exhaust method
  - Dyeing of polyester with a disperse dye in HTHP dyeing machine.
  - Dyeing of wool and nylon with an acid dye by exhaust method
  - Dyeing of acrylic and silk with a basic cationic dye by exhaust method
2. Textile Designing
  - I Sources of design
    - Nature - flora and fauna



- Architecture
- Traditional arts and crafts
- Religion and mythology

## II Process of designing

- Motif development – geometrical, simplified, naturalized, stylized and abstract
- Growth of motif – entering and reducing
- Colour application – colour harmonies and colour ways
- Placement and repeats – sequel arrangement of units: spot, border, overall, line designs (horizontal, vertical, diagonal)
- Types of pattern – centerline, continuous, flowing, (geometrical, abstract, decorative with fruits, flowers, foliage, birds, animals)

## III. Design application

- Designing for blocks, stencil, screen printing
- Design suitability for different fabrics and for special articles of clothing and household use
- Preparation of stencil and screen for printing
- Printing suitable fabrics using direct, acid, azo, disperse and reactive dyes
- Special printing effects on fabric-crepe, burntout, discharge

## HSC 529 Technical Textiles and Textile Ecology

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

### Learning Outcomes:

On successful completion of the course students will be able to:

- Understand meaning, classification and application of technical textiles
- Explain effect of industrial pollution on health and environment
- Know red listed chemicals, allergic dyes, carcinogenic amines and harmful dyes
- Describe eco parameters and eco friendly textiles
- Understand treatment and disposal of textiles effluent and dyes

**Syllabus :****Section A**

1. Technical textiles – meaning, classification, application of technical textiles, manufacturing techniques, future scenario
2. Medical textiles, agro textiles, geo textiles, industrial textiles automotive textiles, phase change materials, shape memory materials, smart textiles

**Section B**

1. Effect of industrial pollution on health and environment, allergic dyes, carcinogenic amines, harmful dyes, red listed chemicals as per eco classification
2. German ban, Indian ban, banned dyes
3. Eco-parameters, eco-friendly textiles
4. International legislation and environmental standards, eco-mark and eco-label

**Section C**

1. Treatment and disposal of textiles affluent and dyes
2. Ecofriendly production and processing of textiles
3. Testing of textiles and auxiliaries, testing facilities, Govt. and private labs

**References:**

1. Horrocks, A.R. (2008). *Handbook of Technical Textiles*. Florida: CRC Press.
2. Mirraftab, M. and Horrocks, A.R. (2007). *Eco-textiles: The way forward for sustainable development in textiles*. Florida: CRC Press.
3. Slater, K. (2003). *Environment Impact of Textiles: Production, Process and Protection*. Florida: CRC Press.

**E-Resources:**

- Classification and application of technical textiles,  
<http://textilelearner.blogspot.com/2012/09/classification-and-applications-of.html>
- Properties, application and uses of technical textiles,  
[http://www.tpot.eu/docs/Workshops/LEITAT\\_5\\_Technical\\_Textiles\\_1.pdf](http://www.tpot.eu/docs/Workshops/LEITAT_5_Technical_Textiles_1.pdf)
- Textile effluent treatment- slide share,  
<https://www.slideshare.net/GranchBerheTseghai/textile-effluent-treatment>

## HSC 532 Textile Merchandising

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**4 0 0 4**

### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Critically analyze the multifaceted profile of textile industry of India
- Learn how to market and sell their own textile products
- Understand the types of retail environments and merchandising strategies
- Pursue themselves in the field of retail management in boutiques, importers, designers and manufacturers as fashion advertising agents, store managers, fashion product developers, fashion retailers, window dressers, and fashion promotion specialists

### **Syllabus :**

#### **Section A**

1. History, development, present status, problems, and export – import trends in cotton, wool, silk, jute and man made textile industries
2. Policies for import and export market, organizations for promoting export in textile and garment industries

#### **Section B**

1. Price determination: pricing policies, factors affecting price determination, causes of price fluctuation, methods of pricing
2. Distribution: channels of distribution for consumer and industrial product, classification of middlemen
3. Retailing and merchandising: terminology, concept & principal, factors affecting merchandising, role and responsibilities of a merchandiser

Marketing trends: assessment of market trends, forecasting and significance in product planning. Merchandising for domestic market (buying houses, department store) and export market

#### **Section C**

1. Sales promotion: advertising, personal selling, publicity, display

2. Labelling: Importance, classification, problems, regulation, care labelling, certification labels – eco labels, wool mark , ISI mark
3. Branding: need, function, types of brands, brand names and their selection

### **References:**

1. Bajaj, C., Tile, R. & Srivastav, V.N. (2011). *Retail Management. Element impression*. Delhi: Oxford University press.
2. Costaintion, M. *Fashion Marketing*. London: PR Batsford LTD.
3. Diamond, J., Diamond, E. & Diamond, S. (2015). *Fashion Retailing – A multi channel approach*. London: Pearson.
4. Donnellan, J. (2015). *Merchandise Buying and Management (4<sup>th</sup> ed.)*. NY: Fairchild Books.
5. Fringes, G. S. (1999). *Fashion from Concept to Consumer* (6th ed.). New Jersey: Prentice Hall.
6. Gerald, J.S. & Sar, P. (2014). *The Real World Guide to Fashion Selling and Management (2<sup>nd</sup> ed.)*. New York: Fairchild Books.
7. Gupta, S.L. (2005). *Brand Management*. Mumbai: Himalaya Publishing House.
8. Jackson, T. & Shaw, D. ( 2006). *The Fashion Handbook*. New York: Routledge – Taylor & Francis Group.
9. Stone, E. & Sampler, J.A. (1985). *Fashion Merchandising*. New York: McGraw Hill Book Co.

## Discipline Electives

### HSC 514 Fabric Manufacture

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**4 0 0 4**

#### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Explain and create basic weaves on handloom
- Interpret methods of developing fabric using fibre, yarn and different fabric making techniques.
- Analyze the discriminatory selection of textiles for specific end uses.
- Create new research ideas and free, creative, inductive thinking

#### **Syllabus :**

##### **Section A**

1. General principles of yarn manufacture:
  - Yarn processing for staple fibers by conventional spinning system
  - Alternate spun yarn process
    - Open end spinning – rotor, vortex, friction, electrostatic and air jet
    - Twist-less spinning
    - Self twist spinning
2. General principles of man-made fiber spinning
  - Fiber spinning methods: wet spinning, melt spinning, dry spinning and solvent spinning
3. Blended yarn, Bicomponent yarn, Film yarn and Multicomponent yarn
4. Textured yarn technology -
  - Texture and its purpose
  - Types and texturing method
  - Process variables in texturing
5. Structural geometry of yarns and their relationship to fabric properties

### Section B

1. Principles of fabric manufacture – basic principles, characteristics and significance of different processes- woven, knitted, non–woven, laces and braids
2. Knitting technology – weft or filling knitting
  - Single , double knit, knitted pile
  - Warp knitting – tricot, raschel, milanese, simplex
  - Knitting machines – flat bed, circular
3. Non – woven technology: non–woven, felts (construction and types)

### Section C

1. Weaving Technology:
  - Sequence of operation in warp and weft preparation
  - Parts of the handloom, motion in weaving
  - Types of looms and loom development
2. Types of weaves - basic and decorative
  - Plain weave and derivatives, twill and satin
  - Honey comb, huck a back, pique, leno, pile, surface figure weaves with extra weft and extra warp yarn, dobby and jacquard
3. Elements of colour and design in weaving

### References:

1. Ajgaonkar, D. W. (1998). *Knitting Technology*. Mumbai: Universal Publishing Corporation.
2. Blinov, I & Belay, S. (1988). *Design of Woven fabrics*. Moscow: Mir Publisher.
3. Goswami, M. & Scardino (1977). *Textile Yarns Technology, Structure and Applications*. New York: John Wiley and sons.
4. Grosicki, I.J. (1989). *Watson's Advanced Textile Design*. London: Newness Butterworths.
5. Hollen, N. & Seddler (1964). *Textile*. (5th ed). New York: Macmillan Publishing.
6. Kadolph, S.. J. & Langford, A. L. (1988). *Textiles*, (8th Ed.). New Delhi: Prentice Hall of India Pvt.
7. Nisbet, H. (1994). *Grammer of Textile Design*. Mumbai: D.B. Taraporvala Sons. & Co. Pvt. Ltd.

**E-Resources:**

- Air Texturizing  
<http://textilelibrary.weebly.com/air-texturizing-process.html>
- Colour and weave relationship in woven fabric  
<https://www.intechopen.com/books/advances-in-modern-woven-fabrics-technology/color-and-weave-relationship-in-woven-fabrics>
- Cotton yarn spinning system  
<http://textilelearner.blogspot.com/2013/08/cotton-yarn-spinning-process.html>
- Manufacture of filament yarns and their texturing  
[http://content.inflibnet.ac.in/data-server/eacharya-documents/53e0c6cbe413016f234436ed\\_INFIEP\\_8/5/ET/8\\_ENG-5-ET-V1-S1\\_\\_lesson.pdf](http://content.inflibnet.ac.in/data-server/eacharya-documents/53e0c6cbe413016f234436ed_INFIEP_8/5/ET/8_ENG-5-ET-V1-S1__lesson.pdf)
- New Spinning Systems  
<http://14.139.172.204/nptel/CSE/Web/116102038/new%20spinning%20systems/open-end%20spinning.htm>
- Textile innovation knowledge platform:weaving process  
<http://www.tikp.co.uk/knowledge/technology/warping-and-weaving/weaving-process/>

**HSC 514L Fabric Manufacture Lab****Max. Marks : 100****L T P C****(CA: 40 + ESA: 60)****0 0 4 2****Syllabus:**

1. Collection of samples of woven fabrics, identification of weaves by visual examination using magnifying glass
2. Drafting and lifting plan of different weaves on graph paper
3. Weaving –
  - a) Setting up of a simple loom
  - b) Sample preparation of following weaves on handloom – plain, twill, rib, satin, basket, pile, stripe and checks

4. Knitting –
  - a) Setting the machine for basic knitting
  - b) Control of design elements
5. Fabric construction through a non – conventional method

### **HSC 558 Textile auxiliaries and their application**

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

#### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Understand various textiles auxiliaries used in textile processing and finishing with eco-friendly auxiliaries

#### **Syllabus :**

##### **Section A**

Definition, history, selection, classification and use in important processing operations in which auxiliaries are used

Methods of evaluation of textile auxiliaries; eco-friendly auxiliaries

##### **Section B**

Chemistry and synthesis of surface active agents- essential requirements of surfactant, classification, anionic surfactants, cationic agents, non-ionic surfactants, biodegradability of surfactants

##### **Section C**

Finishing agents, stiffening agents, cross linking agents, optical brightening agents, softeners, water repellents, flame retarding agents, antistatic agents, soil release agents, antipilling agents, mothproof and mildew proof agents

#### **References :**

1. Bogley, M. (1977). *Textile Dyes, Finishing and Auxiliaries*. Garland Publ.
2. Fiscus, G. & Grunenwald, D. (1996). *Textile Finishing: A Complete Guide*. Textile Institute.
3. Hall, K.J. (1966). *Textile Finishing*. Heywood. Manchester.



## HSC 558L Textile Auxiliaries and Their Application Lab

**Max. Marks : 100**

**L T P C**

**(CA: 40 + ESA: 60)**

**0 0 4 2**

- Collection of various surfactants available in the market; analysis of the surfactant properties in selected surfactants
- Preparation of various sizing combinations; analysis of the sized samples and selection of suitable combinations
- Assessment of whiteness of fabrics finished with various bleaches and optical brightening agents
- Assessment of finished fabrics with selected finishing auxiliaries
- Finishing with eco-friendly auxiliaries and assessment

## HSC 531 Textile Finishes

**Max. Marks : 100**

**L T P C**

**(CA: 40 + ESA: 60)**

**4 0 0 4**

### Learning Outcomes:

On successful completion of the course students will be able to:

- Know importance and objectives of textile finishes
- Understand various finishes for different fabrics
- Classify synthetic resins and understand their chemical structure and application
- Discriminate microscopic structure and determination of gelatinization temperature of different starches
- Understand and apply special purpose finishes
- Determine crease recovery, stiffness of fabrics treated with different finishes

### Syllabus :

#### Section A

1. Importance , objectives and classification of the finishes
2. Different methods of finishing – padding, foam and spray
3. Finishing for wool – carbonizing, decatizing, crabbing and milling
4. Finishes applied on worsted fabrics, pilefabrics, hosiery and lace

### Section B

1. Calendering – treatment and types, swizzing, chasing, friction, embossing, moireing and schreinerising
2. Finishes involving chemical reaction with textiles – mercerising, parchmentising, chlorination and permanent setting of wools
3. Use of enzymes for special finishing

### Section C

1. Synthetic resins - classification, chemical structure and application
2. Application of resin for wash ‘n’ wear and durable press finishes
3. *Special purpose finishes – water proof ,water repellent, flame retardant, antistatic, stain and soil resistant , moth proofing, softening finish, absorbent finish and shrinkage control*

### References :

1. Gohl, E.P.G. & Vilensky, L.D. (1983). *Textile science*. Australia: Longman Cheshire.
2. Marsh, J. T. (1979). *An Introduction to Textile Finishing*. Mumbai: B.I. Publications.
3. Marsh, J. T. (1979). *Textile Science: An Introductory Manual*. Mumbai: B.I. Publications.
4. Shenai, V.A. *Technology of Textile Finishing*. Mumbai: Sevak Publications.
5. Tortora, P.G. (1978). *Understanding Textiles*. New York: McMillan Publishing co.

### E-Resources:

- Textile finishes,  
<http://download.nos.org/srsec321newE/321-E-Lesson-25.pdf>
- Textile finishes – slide share,  
<https://www.slideshare.net/RuchiSardana1/textile-finishes-38312735>

## HSC 531L Textile Finishes Lab

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

L	T	P	C
0	0	4	2

### Syllabus :

1. Microscopic structure of different starches. Determination of gelatinisation temperature of different starches
2. Application of starches and synthetic resin
3. Pick-up and add-on determination. Determination of solid content of resin
4. Determinations of crease recovery, Stiffness of textile fabrics treated with various finishing agents
5. Mercerization of yarn / fabric
6. Application of waterproof, water-repellent, flame retardant, soil resistant & shrinkage control finish

## HSC 548 Knitting Technology

**Max. Marks : 100**  
**(CA: 40 + ESA: 60)**

L	T	P	C
4	0	0	4

### Learning Outcomes:

On successful completion of the course students will be able to:

- gain experience in hand knitting and machine knitting
- have knowledge about Indian knitting industry
- understand the various knitting structure

### Section A

- a) Introduction to knitting – definition of knitting, basic structural terms and principle of knitting technology. Difference between knits and woven
- b) Development of knitting from hand knitting to machine knitting and further developments
- c) Indian Knitting industry – past, present and future
- d) Basic mechanical principles of knitting technology, elements of knitted loop structure, four primary base structures (plain, rib, interlock, purl)

### Section B

- a) Weft knitting and warp knitting – terms and definition used related and warp knitting comparison of weft and warp knitting, classification of weft knitting machines and warp knitting machines
- b) Weft knitting – Basic structure, stitches, designing of weft- knit structures, needle and yarn selection of r weft knitting. Quality control of weft knit fabrics, general calculation for weft knits

### Section C

- a) Warp knitting- development of warp knitting machines, basic warp knit structures and their representation, patterning mechanisms for warp knit designs, yarns for warp knits, general calculations for warp knits. Tricot and Raschel knits – principle, machines and production methods
- b) The structure of a flat knitting machine
- c) Manual operation of flat knitting machine and circular knitting machine
- d) Knitted structures, structured knits, Jacquard knitting, intarsia knitting – Basic principle a stitches and their application
- e) Electronics in knitting

### References

1. Ajgonkar, D.B. Knitting Technology, University Publishing Co-operation, Bombay.
2. Spencer, D.J. Knitting Technology, Pergeman Press, U.K.

## HSC 548L Knitting Technology Lab

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**0 0 4 2**

1. Learning to operate the flat knitting machine and circular knitting machine
2. Marking knitted samples with the 4 basic stitches (plain, rib, purl and interlock)
3. Analysis and testing of knitted samples
4. Yarn calculations for weft and warp knits

## Fourth Semester

### HSC 507 CAD in Textile and Garment Designing

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**2 0 0 2**

**Learning Outcomes:**

On successful completion of the course students will be able to:

- Make use of computer technologies in garment and textile designing
- Utilize each aspect of ‘Computer Added Designing’ (CAD) thoroughly
- Apply appropriate CAD systems in ‘fashion designing units’
- Understand the use of CAD in different sections of textile industry, especially in the field of fashion designing, textile merchandising, textile designing and pattern making

**Syllabus :**

#### Section A

1. RGB colour model
2. Brief overview of CMYK model
3. Monitor Resolution
4. Image file formats-
  - Pixels
  - Bitmap
  - Monochrome bitmap image
  - Grayscale bitmap image
  - 24 bit colour image
  - 16 bit colour image
  - 8 bit colour image
5. Standard system independent formats- GIF, JPEG , TIFF

#### Section B

1. Scope and importance of CAD in industry
2. Use of CAD in textile industry- Weaving, printing, knitting, embroidery, fashion designing, pattern making, grading and marker making

3. Hardware for CAD- Computer: overview of system devices, memory and storage devices, input device, output devices, communication devices, Printer, Scanner
4. Basics of software- Overview of system software, application software
5. CAD modules: Draw, Edit, Data output, System control, Data storage
6. Types of CAD software: generic vs dedicated, 2D, 3 D, Wireframe etc
7. Factors to be considered while selecting CAD software
8. Creating a basic prototype drawing, Drawing drape on figure, Basic Commands and its application, Creating and storing slopers in CAD
9. Theories of drawing figures

### **Section C**

1. Creation of a new pattern from a spec sheet
2. Digitizing of basic pattern
3. Grading of Patterns
4. Marker function, making marker interactively, making markers automatically
5. Plotters and their function

### **References:**

1. Aldrich, W. (Ed.) (1994). *CAD in clothing and textiles* (2<sup>nd</sup> ed.). Oxford, UK: Blackwell Science Ltd.
2. Beazley, A & Bond, T. (2003). *Computer aided pattern design and product development*. Oxford, UK: Blackwell Science Ltd.
3. Gray, S. (1998), *CAD/CAM in Clothing and Textiles*. London, UK: Design Council/Gower.
4. Smith, S. S. (2013). *CAD for fashion design and merchandising*. New York, NY: Fairchild Books.
5. Groover, M. P. & Zimmers, Jr. E. W. (2008). *CAD/CAM: Computer-aided design and manufacturing*. New Delhi: Pearson Education, Inc.

### **E-Resources:**

- A beginners guide to Bitmaps  
<http://paulbourke.net/dataformats/bitmaps/>

- Advanced Cad/cam systems for garment design and simulation  
[https://www.researchgate.net/publication/271216884\\_Advanced\\_CAD\\_CAM\\_systems\\_for\\_garment\\_design\\_and\\_simulation](https://www.researchgate.net/publication/271216884_Advanced_CAD_CAM_systems_for_garment_design_and_simulation)
- Application of Cad/cam in textile Industry  
<http://textilelearner.blogspot.com/2012/03/computer-application-areas-in-textile.html>
- Cad/cam technology: a boon to apparel industry  
[www.researchgate.net/publication/303844333\\_CADCAM\\_TECHNOLOGY\\_A\\_BOON\\_TO\\_APPAREL\\_INDUSTRY](http://www.researchgate.net/publication/303844333_CADCAM_TECHNOLOGY_A_BOON_TO_APPAREL_INDUSTRY)
- Computer application in textile  
<https://www.scribd.com/document/35173915/Computer-Application-in-Textiles-1-vignesh-dhanabalan-pavitra>
- Image file formats  
<http://eye-pix.com/image-file-formats/>
- Plotter  
<https://www.scribd.com/doc/54972334/Plotters>

## **HSC 507L CAD in Textile and Garment Designing Lab**

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

**L T P C**

**0 0 8 4**

### **Syllabus :**

1. Colour shade cards of Munsell and CIE colour system
2. Repeat pattern: all types with various motifs Natural, stylized, geometrical, ethnic, connectional using coral draw
3. Making and innovating new motifs on coral draw and designing article (textiles)
4. Making croquis (men and women) and draping garment
5. Editing and creating photos in Photoshop using all tools at least 20
6. Converting coral drawing pages in to Page Maker
7. Creating and designing patterns
8. Using CAM for basic pattern digitization, creating new patterns, pattern modification and grading, making marker automatically
9. Visit to the industry

## HSC 510 Commercial Clothing

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

L	T	P	C
4	0	0	4

### Learning Outcomes:

On successful completion of the course students will be able to:

- Gain an understanding of process and procedure for establishing an enterprise
- Learn about govt. support and scheme of assistance for entrepreneur
- Acquire knowledge of management skills needed to run an enterprise
- Gain experiential learning to run micro commercial unit

### Syllabus:

#### Section A

1. Business environment for the entrepreneur, government of India's policy towards promotion of entrepreneurship, reservation and sanction for small scale sector
2. Establishing an enterprise-problems, information, source/scheme of assistance

#### Section B

1. Managing boutique, Management technique – planning, organizing, appointing staff, executing, controlling
2. Financial Management – Financial planning, source of finance, institution finance to entrepreneur, working capital management
3. Purchasing – objectives, responsibilities of purchase manager, purchasing policies, purchasing procedure, organization for purchasing, relationship of purchasing with other departments

#### Section C

1. Human resource management-manpower planning, job requirement, recruitment and selection, training and development, remuneration and benefits
2. Marketing management– problems of marketing, market segmentation, marketing mix, an overview of distribution channel
3. Costing
4. *Production management- Investment analysis, plant location*



## References:

1. Cherunilam, F. (1994). *Business Environment*. New Delhi: Himalayan Publishing House.
2. Gupta and Srinivasan (1997). *Entrepreneurship Development in India*. New Delhi: Sultan Chand and Company
3. Jain, P.C. (1998). *Handbook for New Entrepreneurs*. New Delhi: Oxford University Press.
4. Khanka, S.S. (2012). *Entrepreneurial Development*. New Delhi: Sultan Chand and Company.
5. Sudha, G. S. (2006). *Fundamental of Entrepreneurship*. Jaipur: Ramesh Book Depot.
6. Tripathi and Reddy. (2012). *Principles of Business Management*. New Delhi: Tata McGraw Hill.

## HSC 510L Commercial Clothing Lab

**Max. Marks : 100**

**(CA: 40 + ESA: 60)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>8</b>	<b>4</b>

## Syllabus :

- Styling and construction of garment for a particular age group
- Knitting of three articles- cardigan /pullover, baba suit, half sweater
- Fixing of price by keeping profit margin on each garment
- Organizing exhibition and display cum sale
- Visit to boutique to understand their set up and functioning

## READING ELECTIVES

Pattern: Each course will be of two credits. There will be end semester exam only. These courses will not be alternative to regular course. Every M.Sc.(Home Science) student has to opt for at least two reading electives

### HSC 556R Safe and Healthy Environments for Young Children

**Total Marks : 100**  
**(ESA : 100)**

L	T	P	C
0	0	0	2

#### Learning Outcomes:

On successful completion of the course students will be able to:

- Evaluate strategies for the promotion of good health for families, teachers and children in culturally, linguistically, and developmentally appropriate ways
- Identify health, safety, and environmental risks in children's programs
- Analyze the nutritional needs of children at various ages and evaluate the relationship between healthy development and nutrition

#### Content

- Introduction to the laws, regulations, standards, policies and procedures related to child health, safety, and nutrition
- Serving Healthy Food and Drinks to Children in Child Care Programs
- Personal health of the individual, including nutrition, health and safety issues
- Understand how child development influences the risk of injury, conditions in which common childhood injuries occur, safety practices and routines to reduce the risk of children's injuries
- Understand how to establish, communicate, and promote written policies for and safety in child care programs, tools and resources to keep child care programs safe for children
- Roles and responsibilities of the individual, team and community, current health and safety information
- Types and levels of child abuse and knowing how to respond to various situations in a professional manner

- National legislation and regulations regarding human rights, child protection, health and safety as they relate to diverse early learning and care environments

### **Suggested Readings:**

1. Marotz, L.R. (2015). *Health, Safety and Nutrition for the Young Child*. 9<sup>th</sup> Edition, Cengage Learning, Inc
2. Sayre, N.E. Gallagher, J. (2000). *The Young Child and the Environment: Issues Related to Health, Nutrition, Safety, and Physical Activity* 1<sup>st</sup> Edition. Pearson

## **HSC 551R Nanotechnology in Textile**

**Total Marks : 100**

**(ESA : 100)**

**L T P C**

**0 0 0 2**

### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Understand application of nano-technology in textile field
- Develop awareness about social, economic, and ethical issues of nanotechnologies

### **Content**

- Introduction to Nanotechnology

Nano revolution – Nanomaterials – Classification – Properties at nanoscale: optical, electronic and magnetic – Merits of Nanotechnology and risk factors

- Nanoengineered textiles

Nano fibre production - Electrospinning of nano fibers – producing nanofiber structures for tissue engineering – carbon nanotubes and nano composites - multifunctional polymer nanocomposites for industrial applications – nano-filled polypropylene fibers - Improving polymer functionality - Nanostructuring polymers with cyclodextrins, polyolefin/clay nanocomposites

- Nanoelectronics in textiles

Memory Devices and Sensors – Electrochemical cells – Electronic noses – Electrochemical cells – Semiconductor sensor array – Nanotube based sensor

- Nano textiles for medicine and health care  
Types of smart medical textiles, smart medical textile for a particular type of patient
- Health and safety concerns of textiles with nano-materials  
Effect of nanotechnology on human health in textile industry, Why does it matter to workers? Common examples of nanomaterials at the workplace. Routes of human exposure to nanoparticles. How can workers identify nanomaterials? What activities involve working with nanomaterials? What type of health and safety information do workers need to know? Safety control tools at the workplace. Health surveillance during and after exposure. Exposure registries as tools for medical surveillance.

### **Suggested Readings:**

1. Horrocks, A.R. and Anand, S.C. (ed.) (2000). *Handbook of Technical Textiles*, Woodhead Publishing Ltd, Cambridge, England.
2. Brown, P. J. and Stevens, K. (2007). *Nanofibers and Nanotechnology in Textiles*, CRC Press.

## **HSC 559R Textile Conservation**

**Total Marks : 100**  
(ESA : 100)

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>

### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Assess causes of damage of textiles
- Learn different methods of repair and stabilization of textiles

### **Content**

- Importance and scope of textile conservation; various methods for analysis of textiles-fibre content, yarn and fabric structure
- Damage to textiles – pests, micro-organisms etc.
- Condition assessment, repair and stabilization of textile and apparel in museum collections; dry, aqueous and solvent cleaning
- Examination of storage and exhibition techniques, materials, and conditions

- Principles of cleaning fragile textiles; proper conditions for storing and display of various textiles

### **Suggested Readings:**

1. Harris, J. (1993). *Five Thousand Years of Textiles*. British Museum.
2. Leene, J.E. (1972). *Textile Conservation*. London: Butterworths.
3. Williams, J.C. (1977). *Preservation of Paper and Textiles of Historic and Artistic Value*. American Chemicals Society.

## **HSC 553R Onconutrition**

**Total Marks : 100**

**(ESA : 100)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>

The dietary therapy implies qualitative and quantitative changes in the existing food intake, for therapeutic purposes, being a fundamental therapeutic element in different pathologies. This has a major role for patients diagnosed with cancer, the medical nutritional therapy being regarded as a principle of antitumor therapy, as it is a well-known fact that nutrition can change the tumoural process in any stage, and that nutrition and diet could contribute as causing factors in approximately 35% of all malignancies. In this advanced discipline of therapeutic nutrition the student is expected to attain insights about the nutritional assessment, nutritional diagnosis and intervention in accordance to the type of cancer, co morbidities involved, treatment regime while being client centric.

### **Content**

Broad topics (in relation to nutrition oncology) to be covered include:

1. Nutritional assessment and diagnosis
  - Screening and assessment (with tools)
  - History and physical; signs and symptoms
  - Treatment effects
2. Nutritional care
  - Nutrition care process
  - Interventions
  - Education
  - Prioritization of care
  - Nutrition support

3. Reassessment and outcomes
4. Risk reduction
5. Paediatric oncology and nutrition

### **Suggested Readings:**

1. Marian, M., Robert, S. (2010). Clinical nutrition for oncology patients. Jones and Barlett Publishers, LLC.
2. Leser, M., Ledesma, N., Bergerson, S., Trujillo, E., Oncology nutrition for clinical practice. First edition. US: Academy of Nutrition and Dietetics.
3. Thompson, K.L., et. al., (2017). Oncology evidence- based nutrition practice guideline for adults. Journal of the Academy of Nutrition and Dietetics, 117(2): 297-310.  
(doi: <https://doi.org/10.1016/j.jand.2016.05.010>)

### **E-Resources:**

1. Eat Right to Fight Cancer  
<https://www.oncologynutrition.org/erfc>
2. Nutrition in Cancer Care (National Cancer Institute)  
<https://www.cancer.gov/about-cancer/treatment/side-effects/appetite-loss/nutrition-pdq>
3. HealWELL: A cancer nutrition guide (American Institute for Cancer Research)  
<http://www.aicr.org/assets/docs/pdf/education/heal-well-guide.pdf>
4. Nutrition for People with Cancer (American Cancer Society)  
<https://www.cancer.org/treatment/survivorship-during-and-after-treatment/staying-active/nutrition.html>

### **In lieu of the above: Certificate course in Oncology Nutrition (Online course by IAPEN)**

<http://www.iapen.co.in/certificate-course-oncology-nutrition.pdf> (It is an online six months, paid course)

## HSC 539R Colour Science and Instrumentation

**Total Marks : 100**

**(ESA : 100)**

L	T	P	C
0	0	0	2

### Learning Outcomes:

On successful completion of the course students will be able to:

- Explain scientific aspects of color
- Analyze color formulation, assess color differences, color sorting techniques and color perception
- Describe theory of color measurements in solution and on textiles and the instruments used for color measurement

### Content

- Electromagnetic Radiation, electromagnetic spectrum and its uses in physical/organic chemistry, sources of natural and artificial light, properties of artificial light sources, absorption and scattering of light, spectro-photometric curves and their relationship to perceived color
- Relation between color and chemical constitution of dyes, to acquaint with color index
- Instruments for the measurement of color, principles of spectrophotometry, early colorimeter, absorption spectroscopy, Beer-Lamberts law, single beam and double beam spectrophotometer
- Color mixing system, color order system, CIE color specifications, Illuminant, yellowness index and whiteness index, reflectance spectrophotometer, Kubelka-Munk Theory, Relation between K-S and concentration of colorant, understanding color differences, hue, chroma etc.
- Introduction to chromatography and basic instrumentation; application of thin layer chromatography, HPLC and GC in dye analysis

### Suggested Readings:

1. Roderick, M. (1987). *Colour Physics for Industry* (Ed.). West Yorkshire, U K: The Society of Dyers and Colourists.
2. Ewing, G. W. (1985). *Instrumental methods of Chemical Analysis*. New York: McGraw-Hill Book Company.
3. Chatwal, G. R. & Anand, S. (2005). *Instrumental methods of Chemical Analysis*. (5<sup>th</sup> ed.). Mumbai: Himalayan Publishing House.

4. Trotman, E.R. (1970). *Dyeing and Chemical Technology of Fibers*. London: Charles Griffin & Company Limited.
5. Venkatraman, K. (1952). *Chemistry of Synthetic Dyes Part I & II*. New York: Academic Press.

### **HSC 546R Inclusive Education**

**Total Marks : 100**

**L T P C**

**(ESA : 100)**

**0 0 0 2**

#### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Understand inclusive education, different national and international Policies and Frameworks, and the concept of diversity and learning strategies to address diverse learners.

#### **Content:**

- Concepts and principles of Special Education and Inclusive Education
- Central scheme of Inclusive Education , National Commissions & Policies for Inclusive Education
- International Classification of Impairment including ICF 2005
- Diversity in learning and delivering the diverse learning needs ; adaptation, accommodation and modification for Specific Children
- Differentiated Instructions: content, process & product
- Co-teaching Methods: One Teach One Assist, Station-Teaching, Parallel Teaching, Alternate Teaching and Team Teaching
- Peer Mediated Instructions: Class Wide Peer Tutoring, Peer Assisted Learning Strategies
- Universal Design for Learning: Multiple Means of Access, Expression, Engagement & Assessment
- Engaging Gifted Children
- ICT for Instructions
- Stakeholders of Inclusive Education & their Responsibilities; family support and community involvement, resource mobilization



**Suggested Readings:**

1. Dash, N. (2011). *Inclusive Education for Children with Special Needs*. New Delhi: Atlantic.
2. Richards, G. & Armstrong, F. (2011). *Teaching and Learning in Diverse and Inclusive Classrooms key issues for new teachers* (1<sup>st</sup> ed.). New York : Routledge.

**E-Resources:**

1. Special Education, Encyclopedia of children health-  
<http://www.healthofchildren.com/S/Special-Education.html>
2. Educating children with learning problems  
<http://niepid.nic.in/Educating%20Children%20With%20Learning%20Problems.pdf>
3. Mental Retardation-  
<http://www.rehabcouncil.nic.in/writereaddata/mr.pdf>
4. Inclusive Education in India-  
<https://www.pdfdrive.com/inclusive-education-in-india-e52948736.html>
5. Education Exclusion and Inclusion: Policy and Implementation in South Africa and India  
<https://www.pdfdrive.com/education-exclusion-and-inclusion-policy-and-implementation-in-e9544277.html>

**HSC 543R Food Biotechnology****Total Marks : 100****(ESA : 100)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>

Food biotechnology is an important and promising research field that applies biotechnology to the production, processing and manufacture of foodstuffs. It includes the oldest biotechnology processes like food fermentation and brewing, as well as the use of modern biotechnology to improve the genes related to the processing quality of food raw materials, produce high-quality agricultural products, manufacture food additives and cultivate plant and animal cells to access food functional ingredients. Food Biotechnology, more specifically, employs the genetic manipulation of microorganisms for food production. This

content helps to describe the main foods resulting from fermentation and the action of microorganisms responsible for food fermentations, analyze the new Biotechnology, state the genetic processes that are responsible for the biological functions but also how these processes lead to product development, identify key genetically modified food and describe in a broad sense the modern norms on food production, describe the concept of functional foods and their basic categories, and mention the main bioethical problems that arise from Biotechnology applications in the food industry.

### **Contents:**

- Basic concepts of food Biotechnology and its applications in Food Processing
- Microbial cultures for food fermentation; Production of organic acids (vinegar, lactic acid), alcoholic beverages, Propagation of baker's yeasts; Microbial production of vitamins (B2 and B12), antibiotics (penicillin, streptomycin, tetracycline); enzymatic production of glucose, fructose, starch
- Single Cell Protein – Production and process , importance and its applications
- Genetically modified plants in food production:  
Modern approaches to the detection of raw materials or food from genetically modified organisms.
- Food safety issues of new biotechnologies
- New Trends and Tools of Food Biotechnology
- Ethical issues of Food Biotechnology

### **Suggested Readings:**

1. Lee, B.H. (2015) Fundamentals of Food Biotechnology, Wiley-Blackwell; 2nd edition.
2. Sinosh S and Abhilash M (2012) ) Introduction to Food Biotechnology, CBS; 1st edition.

### **Other Learning Resources**

Journal of Food Biotechnology and Research  
Food Science and Biotechnology-Springer

## **HSC 542R Ergonomic Applications in Interior Design**

**Total Marks : 100**

**(ESA : 100)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>

### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Understand the importance of Ergonomics in contemporary work setup and design
- Analyse the applications of Ergonomics in improving work and life conditions

### **Content**

- Introduction and Overview of Ergonomics
- Human centered design
- Anthropometry
- Physical Ergonomics
- Tools and techniques for Ergonomics
- Cognitive Ergonomics
- Physical Environment and its importance
- Biomechanics
- Occupational Ergonomics and use of Ergonomics

### **Suggested Readings:**

1. Bridger, R. S. (2009). *Introduction to Ergonomics*. Florida: CRC Press.
2. Christopher, D. W. (2004). *An Introduction to Human Factors Engineering*. Canada: Pearson.
3. David, C. A (2019). *The practice and management of Industrial Ergonomics*
4. Don, H. *Engineering Psychology and Cognitive Ergonomics*, New Delhi: Springer.
5. Mikell, P. Groover (2007). *Work Systems and the Methods, Measurement, and Management of Work*. NJ: Pearson Education, Inc.

## HSC 545R Functional Clothing

**Total Marks : 100**  
**(ESA : 100)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>

### Learning Outcomes:

On successful completion of the course students will be able to:

- Recognize the importance of portable clothing in textile industry
- Develop and design functional clothing for different applications

### Content:

- Clothing as a portable environment; comfort in clothing - principles of heat transfer in apparels, thermal insulation, breathable textiles, clothing systems for thermal protection
- Designing comfortable apparel suitable for warm and cool weather; impact of protective clothing; sports clothing –requirements, importance and designing; fastening systems in clothing; clothing for visually impaired, blinds and mentally retarded
- Clothing design for military personnels, clothing design to accommodate physical disabilities and irregularities; clothing design for expecting and lactating mothers
- Protective clothing- farm, industrial workers, fire fighters

### Suggested Readings:

1. Cookling, G. (1997). *Garment Technology for Fashion Designers*. Blackwell Science.
2. Kilgus, R. (1999). *Clothing Technology*. Europa Lehrmittel, Textile Institute,
3. Manchester.
4. Tate, M. & Glisson, O. (1967). *Family Clothing*. John Wiley.

## HSC 540R Content Development and Food Labelling

**Total Marks : 100**

**(ESA : 100)**

L	T	P	C
0	0	0	2

Food industry is growing at a rate of 18% and each day a new food product is launched. The demand for creative writers who can develop the content for marketing, advertisement and customer information and design attractive labels in accordance with regulations is high in the sector. This reading elective will enable the students to have a grasp over food and labelling regulations and work part time or full time as skilled content developers and writers in the food and nutrition sector. Topics to be covered will include-

- Creative writing basics
- Principles of content writing
- Content development related to food and nutrition- for labels, brochures, booklets, advertisements
- FSSAI- Roles and responsibilities
- International labelling regulations
- Food labelling regulations in India
- Designing customer friendly labels

### **Suggested Readings:**

1. Blanchfield, J.R. (2000). Food Labelling. Woodhead Publishing.
2. Greenwell, B., Seargeant, P. (2013). From language to creative writing: An introduction. Bloomsbury Publishing.
3. Taub-Dix, B. (2010). Read It Before You Eat It: How to Decode Food Labels and Make the Healthiest Choice Every Time. A Plume Book.

### **Suggested E-Resources:**

1. Check the Label  
<https://www.nestle.in/nhw/understanding-food-labels/check-the-label>
2. Nutrition Information and Labelling  
<https://www.nestle.in/csv/individuals-families/nutrition-information>
3. FSSAI Guidelines on Labelling of Food Products  
<https://www.packaging-labelling.com/articles/fssai-guidelines-on-labelling-of-food-products>
4. FSSAI. Food safety and standards (packaging and labelling) regulations, 2011  
[https://fssai.gov.in/.../Compendium\\_Packaging\\_Labelling\\_Regulations\\_22\\_01\\_2019](https://fssai.gov.in/.../Compendium_Packaging_Labelling_Regulations_22_01_2019)

## **HSC 541R Emerging Technologies for Personalized Nutrition**

**Total Marks : 100**  
**(ESA : 100)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>

Only recently, with the ability to analyze large data sets using artificial intelligence, it has come to fore that how simplistic and naïve the assumption of a universal diet is. A good diet, it turns out, has to be individualized. Coming up with a truly personalized diet would require crunching billions of pieces of data about each person. In addition to analyzing the 40 trillion bacteria from about 1,000 species that reside in our guts, it would need to take into account all of the aspects of that person's health, including lifestyle, family history, medical conditions, immune system, anatomy, physiology, medications and environment. This would require developing an artificial intelligence (AI) more sophisticated than anything yet on the market and the students are expected to get exposed to the technology of tomorrow by taking up this elective.

Topics to be covered include:

- Personalized nutrition and its importance
- Apps and softwares for meal planning
- Factors in personalized nutrition- metabolism, micro biome, lifestyle, health profile, non communicable and other diseases and the like
- Introduction to artificial intelligence (AI) and nutrigenetics
- Existing AI based apps for personalized nutrition and future possibilities
- AI based nutritional meal planning for patients suffering from diabetes and cancer
- Applications of AI in nutrition research and food industry

### **Suggested Readings:**

1. Kohlmeier, M. (2016). Applying the science of personal nutrition. 2<sup>nd</sup> edition. Academic Press.
2. Patterson, D.W. (2015). Introduction to artificial intelligence. Pearson.
3. Agah, A. (2017). Medical applications of artificial intelligence. CRC Press.

4. Ordovas, J.M., Ferguson, L.R., Tai, E.S., Mathers, J.C. (2018). Personalised nutrition and health. British Medical Journal, 361 (doi: <https://doi.org/10.1136/bmj.k2173>)
5. Zeevi, D. et al. Personalized nutrition by prediction of glycemic responses. Cell 163, 1079-1094 (2015). Doi:<https://doi.org/10.1016/j.cell.2015.11.001>

### **Suggested E learning**

1. Opinion- The A.I. Diet  
<https://www.nytimes.com/2019/03/02/opinion/sunday/diet-artificial-intelligence-diabetes.html>
2. The Personalized Nutrition Project  
<http://newsite.personalnutrition.org/WebSite/Home.aspx>
3. Healthy Diet- National Health Portal  
<https://www.nhp.gov.in/healthyliving/healthy-diet>

## **HSC 557R Sports Nutrition**

**Total Marks : 100**

**(ESA : 100)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>

### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Understand the role of ergogenic aids, their dose, safety and efficiency to enhance sports performance.
- Plan diet for sports person

### **Contents**

- Nutrition for sports person.
- Macronutrients-CHO, protein and fat its importance, sources and requirement for sports person.
- Micronutrients-Vitamins and minerals fat its importance, sources and requirement for sports person.
- Diet manipulation in pre and post events meal.
- Losses and replenishment of water and electrolytes during sports events.

- Effects of dehydration
- Types and importance of sports drinks.
- Uses of nutritional supplements in sports person-uses, effects, efficacy and safety of
- Creatine monohydrate, Sodium bicarbonates, Nitrates, B-Alanine, Caffeine, Protein supplements and Fat burner

### **Suggested Readings:**

1. Seebohar, B. (2011). Nutrition periodization for athletes: Taking traditional sports nutrition to the next level. Bull publishing company.
2. Helms, E.R., Aragon, A.A. & Fitschen, Resources: P.J. (2014). Evidence based recommendation for natural bodybuilding contest preparation: nutrition & supplementation. J of the International society of sports nutrition, 11 (1) 20.

### **Suggested E learning**

<https://www.acs.edu.au>

<https://www.sportmedbc.com>

<http://www.sciencedirect.com>

## **HSC 430R Introduction to Nutrigenomics**

**Total Marks : 100**

**(ESA : 100)**

**L T P C**

**0 0 0 2**

### **Learning Outcomes:**

On successful completion of the course students will be able to:

- Understand interaction between nutrients and bioactive food components with the genome
- Understand use of nutrigenomics to prevent diseases and improve quality of life
- Create diets specifically designed for individuals or groups of individuals with a genetically identified dietary need or restriction to treat disease



**Content :**

The elucidation of the human genome has created a unique opportunity to utilize nutrients and bioactive food components to improve the quality of life of people through the use of diet in the prevention and intervention of human disease. The students are expected to read the background of nutrigenomics and should be able to understand “what is nutrigenomics and how can it be used to improve quality of life?” Scope of the elective would be limited to the diseases that can be addressed by nutrigenomics and knowledge about what genes/ gene products are of importance in the diseases.

- Rationale and importance of nutrigenomics applications.
- Why single nutrition recommendations will not fit everybody or even a majority of
- modern humans?
- How genetic variation shapes individual nutrition requirements and sensitivities?
- Gene- nutrient interactions.
- How nutrigenomics and nutrigenetics can help modulate disease risk in cardiovascular
- Disease, obesity, diabetes, and inflammatory bowel disease?
- Regulatory challenges, genetic testing for consumers, data mining,

**Suggested Readings:**

1. Ferguson, L.R. (Ed.) (2013). Nutrigenomics and nutrigenetics in functional foods and
2. Personalized nutrition. CRC Press.
3. Nutrigenomics and the Future of Nutrition: Proceedings of a Workshop (2017).
4. National Academies of Sciences, Engineering, and Medicine, Health and Medicine
5. Division, Food and Nutrition Board, Washington DC,
6. Kohlmeier, M. (2016). Applying the science of personal nutrition. 2 nd edition.
7. Academic Press.

**Suggested E-Resources:**

1. Foundations in nutrigenomics  
<http://ctgeducation.com/wp-content/uploads/2016/09/Translational-Nutrigenomics-Course-Brochure.pdf>
2. E-resources and journals of International Society of Nutrigenetics/ Nutrigenomics  
<http://www.nutritionandgenetics.org/>
3. In lieu of the above course, students can opt for online course on-  
NUTRIGENOMICS FOR DISEASE PREVENTION AND INTERVENTION  
<https://www.nutrigenomics.arizona.edu/home.html>

## **HSC 431R Novel Technologies for Food Processing and Shelf Life Extension**

**Total Marks : 100****(ESA : 100)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>

**Learning Outcomes:**

On successful completion of the course students will be able to:

- Quality and safety aspects of food
- Factors affecting quality during processing and storage
- Role of water in food and its shelf Life

**Content:**

- Introduction to food processing, preservation and quality; Basic principles & methods, water activity vs. food stability, structure-function relationship.
- Chemical changes in food during processing; Browning reactions (enzymatic and non-enzymatic), protein interactions, carbohydrate interactions.
- High pressure processing and Membrane technologies in food processing.
- Food irradiation, RF & microwave heating; Super critical fluid extraction.

- Food extrusion technology, RTE snack foods, textured vegetable protein, Rice and pulses analogues.
- Hurdle technology concept, Natural antimicrobials & bacteriocin; Freeze drying.
- Controlled atmosphere storage of food grains; ozone, microwave treatment for disinfestations of grains, detection of spoilage in grains.
- Modified atmosphere packaging, Active packaging, and Edible coating of fruits & vegetables.
- Extraction and processing of oil; Mechanical expellers, solvent extraction, refining, hydrogenation, winterization. Shelf life extension of oils using natural antioxidants; Concept and measurement of rancidity.
- Functional foods and Nutraceuticals, Ready-to-eat therapeutic food, micronutrient fortified high energy bar, gluten free bread, carbonated cereal beverage.

#### **Suggested Readings:**

1. Desrosier, N.W. (1977). *Elements of Food Technology*. Westport, Connecticut, USA : AVI Publishing Company, Inc.
2. Fellows, P. J. (2000). *Food Processing Technology: Principles and Practice* . Cambridge; England: Woodhead Publishing.
3. Owen, R. F. (1975). *Principles of Food Science Part 1 and Part 2*. New York: Basel; Dekkar
4. Richardson, T. and Finley, J.W. (1985). *Chemical Changes in Food During Processing*. Westport. CT VI Publishing Company. Inc.,

**In lieu of the above course, students can opt for online course on-  
<https://nptel>**

## HSC 432R Science of Clothing Comfort

**Total Marks : 100**

**(ESA : 100)**

L	T	P	C
0	0	0	2

### Learning Outcomes:

On successful completion of the course students will be able to:

- Develop understanding of factors affecting clothing comfort
- Design comfortable clothing

### Content:

- Understanding Clothing Comfort: components, clothing comfort and wearer attitude ( human-clothing interactions)
- Psycho-physiological factors of Clothing Comfort: Psychological perceptions, sensory perceptions, psychophysics, aesthetic comfort
- Tactile aspects of clothing comfort: tactile characteristics of clothing, parameters affecting Tactile sensations and human tactile responses, fabric handle attributes for expressing tactile comfort
- Thermal comfort of clothing: fabric thermal transmission & thermo-regulation in human body, Thermal Distress
- Moisture Transmission: liquid water transfer (wicking and water absorption), principles of moisture vapour transfer and condensation
- Combined heat and moisture interactions with textile materials: factors affecting heat and mass transfer through fabrics. Thermal insulation during sweating dampness, clamminess and heat loss during high activity ,buffering effect of clothing
- Garment fit and comfort relationship: factors related to garment fit; body dimensions and pattern, garment fit (tight-fit and loose-fit ) and pressure, air gap thickness, garment ventilation, fluctuating microclimate in loose-fit garment

### Suggested Readings:

1. Das, A. & Alagirusamy, R. (2010). *Science in Clothing Comfort*. New Delhi: Woodhead Publishing India Ltd.
2. Textile Progress: Vol. 1 , 2, 8, 9, 31 & 38.
3. Pan, N. & Gibson, P. (2006). *Thermal and moisture transport in fibrous materials*. England: Woodhead Publishing Limited.

**In lieu of the above course, students can opt for online course on-**  
<http://swayam.gov.in>