

# FACULTY OF SCIENCES

## SYLLABUS

### FOR

**Bachelor of Vocation (B.Voc.)  
(NUTRITION AND DIET PLANNING)  
(SEMESTER: I-IV)**

**Examinations: 2019-20**



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# GURU NANAK DEV UNIVERSITY AMRITSAR

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  - (ii) **Subject to change in the syllabi at any time.  
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Bachelor of Vocation (B.Voc.)  
(Nutrition and Diet Planning) (Semester System)

**SEMESTER-I**

**QUALIFICATION PACK : (Fitness Trainer NSQF Level IV)**

	<b>Paper Code.</b>	<b>Subject</b>	<b>Theory Marks</b>	<b>Duration</b>	<b>Practical Marks</b>	<b>Total Marks</b>
<b>General Component</b>	Paper-I	Communication Skills in English-I	50	3 Hrs		50
	Paper-II	Punjabi (Compulsory) <b>OR</b> *ਮੁੱਢਲੀ ਪੰਜਾਬੀ <b>OR</b> **Punjab History & Culture	50	3 Hrs		50
	Paper-III	***Drug Abuse: Problem, Management and Prevention (Compulsory)	50	3 Hrs		
<b>Skill Component</b>	Paper-IV	Human Physiology	70	3 Hrs	30	100
	Paper-V	Basic Nutrition	75	3 Hrs	50	125
	Paper-VI	Public Health and Nutrition	75	3 Hrs		75
<b>TOTAL =</b>					<b>400</b>	

**Note:**

1. \*Special Paper in lieu of Punjabi Compulsory.
2. \*\*For those students who are not domicile of Punjab
3. \*\*\*This paper marks will not be included in the total marks.

Bachelor of Vocation (B.Voc.)  
(Nutrition and Diet Planning) (Semester System)

**SEMESTER-II**

**QUALIFICATION PACK : (Assistant Dietician NSQF Level V)**

	<b>Paper Code.</b>	<b>Subject</b>	<b>Theory Marks</b>	<b>Duration</b>	<b>Practical Marks</b>	<b>Total Marks</b>
<b>General Component</b>	Paper-I	Communication Skills in English-II	35	3 Hrs	15	50
	Paper-II	Punjabi (Compulsory) <b>OR</b> 'ਮੁੱਢਲੀ ਪੰਜਾਬੀ' <b>OR</b> **Punjab History & Culture	50	3 Hrs		50
	Paper-III	***Drug Abuse: Problem, Management and Prevention (Compulsory)	50	3 Hrs		-
<b>Skill Component</b>	Paper-IV	Food Preservation and Storage	50	3 Hrs	70	120
	Paper-V	Nutritional Biochemistry	80	3 Hrs	50	130
	Paper-VI	Nutrition and Immunity	50	3 Hrs		50
					<b>TOTAL =</b>	<b>400</b>

**Note:**

1. \*Special Paper in lieu of Punjabi Compulsory.
2. \*\*For those students who are not domicile of Punjab
3. \*\*\*This paper marks will not be included in the total marks.

Bachelor of Vocation (B.Voc.)  
(Nutrition and Diet Planning) (Semester System)

**SEMESTER-III**

	<b>Paper</b>	<b>Subject</b>	<b>Theory Marks</b>	<b>Duration</b>	<b>Practical</b>	<b>Duration</b>	<b>Total Marks</b>
<b>Skill Component</b>	PAPER-I	Computer Fundamentals	40	3Hrs	60	3Hrs	100
	PAPER-II	Food Toxicology	50	3Hrs			50
	PAPER-III	Food Microbiology	75	3Hrs	25	3Hrs	100
	PAPER-IV	Food Science I	75	3Hrs	75	4Hrs	150
						<b>TOTAL = 400</b>	

**SEMESTER-IV**

	<b>Paper Code</b>	<b>Subject</b>	<b>Theory Marks</b>	<b>Duration</b>	<b>Practical</b>	<b>Duration</b>	<b>Total Marks</b>
<b>Skill Component</b>	PAPER-I	Human values in education	100	3Hrs			100
	PAPER-II	Meal Management	75	3Hrs	50	5Hrs	125
	PAPER-III	Institutional Food Service Management	75	3Hrs	50	4Hrs	125
	PAPER-IV	Food Science II	50	3Hrs			50
<b>General Component</b>	PAPER-V	*ESL-221: Environmental Studies (Compulsory)	100	3Hrs			
						<b>TOTAL=</b>	<b>400</b>

**\*Note : This paper marks will not be included in the total marks.**

Bachelor of Vocation (B.Voc.)  
(Nutrition and Diet Planning) (Semester-I)

**Paper-I: COMMUNICATION SKILLS IN ENGLISH-I**

**Time: 3 Hours**

**Max. Marks: 50**

**Instructions for the Paper Setters:-**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**The syllabus is divided in four sections as mentioned below:**

**Section–A**

**Reading Skills:** Reading Tactics and strategies; Reading purposes–kinds of purposes and associated comprehension; Reading for direct meanings.

**Section–B**

Reading for understanding concepts, details, coherence, logical progression and meanings of phrases/ expressions.

**Activities:**

- Comprehension questions in multiple choice format
- Short comprehension questions based on content and development of ideas

**Section–C**

**Writing Skills:** Guidelines for effective writing; writing styles for application, personal letter, official/ business letter.

**Activities**

- Formatting personal and business letters.
- Organising the details in a sequential order

**Section–D**

Resume, memo, notices etc.; outline and revision.

**Activities:**

- Converting a biographical note into a sequenced resume or vice-versa
- Ordering and sub-dividing the contents while making notes.
- Writing notices for circulation/ boards

**Recommended Books:**

1. *Oxford Guide to Effective Writing and Speaking* by John Seely.
2. *English Grammar in Use* (Fourth Edition) by Raymond Murphy, CUP

Bachelor of Vocation (B.Voc.)  
(Nutrition and Diet Planning) (Semester-I)

**Paper-II: ਪੰਜਾਬੀ (ਲਾਜ਼ਮੀ)**

ਸਮਾਂ : 3 ਘੰਟੇ

ਕੁਲ ਅੰਕ : 50

**ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ**

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਭਾਗ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਇੱਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਭਾਗ ਵਿੱਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿੱਚ ਕਰ ਸਕਦਾ ਹੈ।

**ਪਾਠ-ਕ੍ਰਮ ਅਤੇ ਪਾਠ-ਪੁਸਤਕਾਂ**

**ਸੈਕਸ਼ਨ-ਏ**

ਆਤਮ ਅਨਾਤਮ (ਕਵਿਤਾ ਭਾਗ),  
(ਸੰਪ. ਸੁਹਿੰਦਰ ਬੀਰ ਅਤੇ ਵਰਿਆਮ ਸਿੰਘ ਸੰਧੂ)  
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ।  
(ਪ੍ਰਸ਼ਗ ਸਾਹਿਤ ਵਿਆਖਿਆ, ਸਾਰ )

**ਸੈਕਸ਼ਨ-ਬੀ**

ਇਤਿਹਾਸਕ ਯਾਦਾਂ (ਇਤਿਹਾਸਕ ਲੇਖ-ਸੰਗ੍ਰਹਿ)  
ਸੰਪਾ. ਸ.ਸ.ਅਮੋਲ,  
ਪੰਜਾਬੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ, ਲੁਧਿਆਣਾ। (ਲੇਖ 1 ਤੋਂ 6)  
(ਨਿਬੰਧ ਦਾ ਸਾਰ, ਲਿਖਣ-ਸ਼ੈਲੀ)

**ਸੈਕਸ਼ਨ-ਸੀ**

(ੳ) ਪੈਰਾ ਰਚਨਾ  
(ਅ) ਪੈਰਾ ਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉੱਤਰ।

**ਸੈਕਸ਼ਨ-ਡੀ**

(ੳ) ਪੰਜਾਬੀ ਯੁਨੀ ਵਿਉੱਤ : ਉਚਾਰਨ ਅੰਗ, ਉਚਾਰਨ ਸਥਾਨ ਤੇ ਵਿਧੀਆਂ, ਸਵਰ, ਵਿਅੰਜਨ,  
ਸੁਰ-ਪ੍ਰਥਮ।  
(ਅ) ਭਾਸ਼ਾ ਵੰਨਗੀਆਂ : ਭਾਸ਼ਾ ਦਾ ਟਕਸਾਲੀ ਰੂਪ, ਭਾਸ਼ਾ ਅਤੇ ਉਪ-ਭਾਸ਼ਾ ਦਾ ਅੰਤਰ, ਪੰਜਾਬੀ  
ਉਪਭਾਸ਼ਾਵਾਂ ਦੇ ਪਛਾਣ-ਚਿੰਨ੍ਹ।

Bachelor of Vocation (B.Voc.)  
(Nutrition and Diet Planning) (Semester-I)

**Paper-II: ਮੁੱਢਲੀ ਪੰਜਾਬੀ**  
(In lieu of Compulsory Punjabi)

ਸਮਾਂ : 3 ਘੰਟੇ

ਕੁਲ ਅੰਕ: 50

**ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ**

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਭਾਗ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਇੱਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਭਾਗ ਵਿੱਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿੱਚ ਕਰ ਸਕਦਾ ਹੈ।

**ਪਾਠ-ਕ੍ਰਮ**

**ਸੈਕਸ਼ਨ-ਏ**

ਪੈਂਤੀ ਅੱਖਰੀ, ਅੱਖਰ ਕ੍ਰਮ, ਪੈਰ ਬਿੰਦੀ ਵਾਲੇ ਵਰਣ ਅਤੇ ਪੈਰ ਵਿਚ ਪੈਣ ਵਾਲੇ ਵਰਣ ਅਤੇ ਮਾਤ੍ਰਵਾਂ (ਮੁੱਢਲੀ ਜਾਣ-ਪਛਾਣ)  
ਲਗਾਖਰ (ਬਿੰਦੀ, ਟਿੱਪੀ, ਅੱਧਕ) : ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ

**ਸੈਕਸ਼ਨ-ਬੀ**

ਪੰਜਾਬੀ ਸ਼ਬਦ-ਬਣਤਰ : ਮੁੱਢਲੀ ਜਾਣ-ਪਛਾਣ  
(ਸਾਧਾਰਨ ਸ਼ਬਦ, ਸੰਯੁਕਤ ਸ਼ਬਦ, ਮਿਸ਼ਰਤ ਸ਼ਬਦ, ਮੂਲ ਸ਼ਬਦ, ਅਗੇਤਰ ਅਤੇ ਪਿਛੇਤਰ)

**ਸੈਕਸ਼ਨ-ਸੀ**

ਨਿੱਤ ਵਰਤੋਂ ਦੀ ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲੀ : ਬਾਜ਼ਾਰ, ਵਪਾਰ, ਰਿਸ਼ਤੇ-ਨਾਤੇ, ਖੇਤੀ ਅਤੇ ਹੋਰ ਧੰਦਿਆਂ ਆਦਿ ਨਾਲ ਸੰਬੰਧਤ।

**ਸੈਕਸ਼ਨ-ਡੀ**

ਹਫ਼ਤੇ ਦੇ ਸੱਤ ਦਿਨਾਂ ਦੇ ਨਾਂ, ਬਾਰ੍ਹਾਂ ਮਹੀਨਿਆਂ ਦੇ ਨਾਂ, ਰੁੱਤਾਂ ਦੇ ਨਾਂ, ਇਕ ਤੋਂ ਸੌ ਤਕ ਗਿਣਤੀ ਸ਼ਬਦਾਂ ਵਿਚ ।

Bachelor of Vocation (B.Voc.)  
(Nutrition and Diet Planning) (Semester-I)

**Paper-II: Punjab History & Culture (From Earliest Times to C 320)**  
**(Special Paper in lieu of Punjabi compulsory)**  
**(For those students who are not domicile of Punjab)**

**Time: 3 Hours**

**Max. Marks: 50**

**Instructions for the Paper Setters:-**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**Section A**

1. Physical features of the Punjab and its impact on history.
2. Sources of the ancient history of Punjab

**Section B**

3. Harappan Civilization: Town planning; social, economic and religious life of the Indus Valley People.
4. The Indo-Aryans: Original home and settlements in Punjab.

**Section C**

5. Social, Religious and Economic life during *Rig* Vedic Age.
6. Social, Religious and Economic life during Later Vedic Age.

**Section D**

7. Teachings and impact of Buddhism
8. Jainism in the Punjab

**Suggested Readings**

1. L. M Joshi (ed.), *History and Culture of the Punjab*, Art-I, Patiala, 1989 (3<sup>rd</sup> edition)
2. L.M. Joshi and Fauja Singh (ed.), *History of Punjab*, Vol.I, Patiala 1977.
3. Budha Parkash, *Glimpses of Ancient Punjab*, Patiala, 1983.
4. B.N. Sharma, *Life in Northern India*, Delhi. 1966.
5. Chopra, P.N., Puri, B.N., & Das, M.N.(1974). *A Social, Cultural & Economic History of India*, Vol. I, New Delhi: Macmillan India.



Bachelor of Vocation (B.Voc.)  
(Nutrition and Diet Planning) (Semester-I)

**Paper-III: Drug Abuse: Problem, Management and Prevention  
(COMPULSORY PAPER)**

**PROBLEM OF DRUG ABUSE**

**Time: 3 Hours**

**Max. Marks: 50**

**Instructions for the Paper Setters:-**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**Section – A**

**Meaning of Drug Abuse:**

Meaning, Nature and Extent of Drug Abuse in India and Punjab.

**Section – B**

**Consequences of Drug Abuse for:**

Individual	:	Education, Employment, Income.
Family	:	Violence.
Society	:	Crime.
Nation	:	Law and Order problem.

**Section – C**

**Management of Drug Abuse:**

Medical Management: Medication for treatment and to reduce withdrawal effects.

**Section – D**

Psychiatric Management: Counselling, Behavioural and Cognitive therapy.

Social Management: Family, Group therapy and Environmental Intervention.

**References:**

1. Ahuja, Ram (2003), *Social Problems in India*, Rawat Publication, Jaipur.
2. Extent, Pattern and Trend of Drug Use in India, Ministry of Social Justice and Empowerment, Government of India, 2004.
3. Inciardi, J.A. 1981. *The Drug Crime Connection*. Beverly Hills: Sage Publications.
4. Kapoor. T. (1985) *Drug epidemic among Indian Youth*, New Delhi: Mittal Pub.
5. Kessel, Neil and Henry Walton. 1982, *Alcoholism*. Harmond Worth: Penguin Books.
6. Modi, Ishwar and Modi, Shalini (1997) *Drugs: Addiction and Prevention*, Jaipur: Rawat Publication.

Bachelor of Vocation (B.Voc.)  
(Nutrition and Diet Planning) (Semester-I)

7. National Household Survey of Alcohol and Drug abuse. (2003) New Delhi, Clinical Epidemiological Unit, All India Institute of Medical Sciences, 2004.
8. Ross Coomber and Others. 2013, *Key Concept in Drugs and Society*. New Delhi: Sage Publications.
9. Sain, Bhim 1991, *Drug Addiction Alcoholism, Smoking obscenity* New Delhi: Mittal Publications.
10. Sandhu, Ranvinder Singh, 2009, *Drug Addiction in Punjab: A Sociological Study*. Amritsar: Guru Nanak Dev University.
11. Singh, Chandra Paul 2000. *Alcohol and Dependence among Industrial Workers*: Delhi: Shipra.
12. Sussman, S and Ames, S.L. (2008). *Drug Abuse: Concepts, Prevention and Cessation*, Cambridge University Press.
13. Verma, P.S. 2017, "*Punjab's Drug Problem: Contours and Characteristics*", Economic and Political Weekly, Vol. LII, No. 3, P.P. 40-43.
14. World Drug Report 2016, United Nations office of Drug and Crime.
15. World Drug Report 2017, United Nations office of Drug and Crime.

Bachelor of Vocation (B.Voc.)  
(Nutrition and Diet Planning) (Semester-I)

**Paper-IV: HUMAN PHYSIOLOGY (Theory)**

**Time: 3 Hours**

**Max. Marks: 100**

**Theory: 70**

**Practical: 30**

**Instructions for the Paper Setters:-**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**Course Content**

**SECTION-A**

- Cell structure: Function and multiplication. Introduction to cell physiology and cell membrane transport mechanism.
- Tissues: Types, structure and their functions.
- Circulatory system: Anatomy and functions. Heart rate, cardiac cycle. Cardiac output. Blood composition and functions. Blood clotting, blood grouping, radial pulse, blood pressure and factors affecting it. Blood vessels, arteries, veins and capillaries. Hypertension, ECG and Artherosclerosis.

**SECTION-B**

- Skeletal System: Bones, joints and bone deformities (in brief).
- Muscular system: Types of Muscles (striated and non-striated). Mechanism of muscle contraction. Physiology of exercise and fatigue.
- Lymphatic system: Lymph glands and its function, spleen-structure and functions.
- Digestive system: Anatomy and functions of alimentary tract and accessory organs. Digestion and absorption of food. GIT movements.

**SECTION-C**

- Endocrine System: List of endocrine glands, their hormones, functions and their disorders (in brief).
- Respiratory system: Anatomy, functions, mechanisms of external and internal respiration. Hypoxia, apnea, asthma and dyspnea.
- Nervous system: Structure of a nerve cell and nerve fibre. Classification of nervous system. Central nervous system- Brain and spinal cord. Functions of different parts of the brain. Peripheral nervous system. Automatic and sympathetic nervous system-their functions. Nerve impulse, synapse and reflex action, voluntary and involuntary action (in brief).

Bachelor of Vocation (B.Voc.)  
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**SECTION-D**

- Urinary system: Anatomy and functions. Formation and composition of urine, hemostasis, micturition, kidney failure and dialysis.
- Skin: Structure and functions
- Reproductive system: Structure and functions of male and female reproductive organs. Menstruation, puberty, fertilization and development of fertilized ovum. Placenta and its function, parturition and menopause.
- Sensory organs: General sensory receptors and physiology of special senses-vision, hearing equilibrium and their disorders (in brief).

**Suggested Readings:-**

1. Keele, C.A. and Neil, E. (1978). Samson Wright's Applied Physiology, Oxford University Press.
2. Tortora, G.J. and Anagnostakos, N.P. (1984). Principles of Anatomy and Physiology, harper and Row Publisher, New York.
3. Best, C.H. and Taylor, N.B. (1964). The Living Body, 4<sup>th</sup> ed. Asis Publishing House, Bombay.
4. Guyton, A.C. (1969). Functions of the Human Body, W.B. Saunders Co., Philadelphia.
5. Wilson, K.J.W. (1990). Anatomy and Physiology in Health and Illness, ELBS/Churchill Livingstone.
6. Vidhya Ratan. (1986). Handbook of Human Physiology, New Central Book Agency, Calcutta.

Bachelor of Vocation (B.Voc.)  
(Nutrition and Diet Planning) (Semester-I)

**PAPER-IV : HUMAN PHYSIOLOGY (Practical)**

**Marks: 30**

- Study of different types of microscopes and their uses.
- Microscopic examination of permanent slides.
- Identification of different blood groups.
- Identification of blood cells by study of peripheral blood smear.
- Measurement of pulse and blood pressure.
- Elicitation of reflexes and jerks.
- Estimation of hemoglobin, RBC, WBC, TLC, DLC and ESR.

Bachelor of Vocation (B.Voc.)  
(Nutrition and Diet Planning) (Semester-I)

**Paper-V: BASIC NUTRITION (Theory)**

**Time : 3 Hrs.**

**Max. Marks : 125**

**Theory : 75**

**Practical : 50**

**Instructions for the Paper Setters:-**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**Section-A**

Introduction to nutrition – Food as a source of nutrients, definition of nutrition, malnutrition, Importance of water in Nutrition.

Methods of enhancing nutritive value of food by fermentation, sprouting and supplementation, fortification and enrichment.

**Section-B**

**Carbohydrates**

1. Composition
2. Classification
3. Functions
4. Food sources
5. Requirements and deficiencies.

**Section-C**

**Fats and oils**

1. Composition
2. Classification
3. Types of Fats
4. Food sources
5. Functions
6. Requirement and deficiencies

**Protein**

1. Composition
2. Classification
3. Amino acids
4. Food sources
5. Function and Deficiencies

**Section-D**

Energy- Unit of energy, food as a source of energy, energy value of food, body need of energy. Factors affecting energy requirement.

**Vitamin and minerals**

1. Classification
2. Units of measurements sources
3. Functions and Deficiency

Bachelor of Vocation (B.Voc.)  
(Nutrition and Diet Planning) (Semester-I)

**Paper-V: BASIC NUTRITION (Practical)**

**Marks: 50**

- Use and care of kitchen equipments.
- Weights and measures- standard, household measures for raw and cooked food.
- Preparation of minimum three dishes of each cooking method given below and their suitability for different meals:
  - a) Boiling e.g. variation of pulses, soups, kheer, custard pudding etc.
  - b) Shallow frying e.g. variations of stuffed paranthas, pan cakes, tikkies etc.
  - c) Deep frying e.g. variation of cutlets, pakoras etc.
  - d) Steaming e.g. dhokla, idli, plain and variation etc.
  - e) Baking e.g. cakes and biscuits etc.
  - f) Fermentation e.g. dosa, vada etc.
  - g) Sprouting.

Bachelor of Vocation (B.Voc.)  
(Nutrition and Diet Planning) (Semester-I)

**Paper-VI: PUBLIC HEALTH & NUTRITION (THEORY)**

**Time : 3 Hrs.**

**Max. Marks : 75**

**Instructions for the Paper Setters:-**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**COURSE CONTENT**

**Section-A**

Definition of public health nutrition and health promotion, public health nutrition cycle, public health approaches- socio ecological approach and biological approach.

Assessment of nutritional status in individuals and population: Anthropometry, biomarker, clinical assessment and dietary assessment- method and their advantages and disadvantages.

**Section -B**

Assessment of physical activity: Physical activity and health, dimensions of physical activity, assessment method- principle, advantages and disadvantages of objective methods .

**Section-C**

Public health education: Health education- definition, objectives, content and principles. Communication in public health education –key elements and barriers of communication, audio visual aids in communication, levels of Health education. Planning and evaluation of education program.

**Section-D**

Communicable and non communicable disease- cause, modes of transmission and prevention methods.

Public health aspects of over and under nutrition: BMI criteria by WHO, Obesity as a determinant of mortality and morbidity, under nutrition – definitions, clinical syndromes and public health consequences of under nutrition.

Nutrition related policies and programs: Health, nutrition and family welfare through XII<sup>th</sup> five year plan, ICDS- Objectives and Services, Public Distribution System, National Food security Act, National food for work program.

National and international agencies in combating malnutrition: international- WHO ,FAO UNICEF AIM AND FUNCTION . National –ICAR,ICMR,NIN,NFI,CFTRI, NNMB,NSI, FNB – Aim and functions.

**REFERENCES:**

1. Micheal J. Gibney, Barrie M. Margetts, John M.Kearney and Lenore Arab, Public health and nutrition, black well publishing company.2005.
2. Srilakshmi B, nutrition science, fifth edition, new age international(P) limited.2016



Bachelor of Vocation (B.Voc.)  
(Nutrition and Diet Planning) (Semester-II)

**PAPER-I: COMMUNICATION SKILLS IN ENGLISH-II**

**Time: 3 Hours**

**Max. Marks: 50**  
**Theory Marks: 35**  
**Practical Marks: 15**

**Instructions for the Paper Setters:-**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**Course Contents:**

**SECTION-A**

**Listening Skills:** Barriers to listening; effective listening skills; feedback skills.

**Activities:** Listening exercises – Listening to conversation, News and TV reports

**SECTION-B**

Attending telephone calls; note taking and note making.

**Activities:** Taking notes on a speech/lecture

**SECTION-C**

**Speaking and Conversational Skills:** Components of a meaningful and easy conversation; understanding the cue and making appropriate responses; forms of polite speech; asking and providing information on general topics.

**Activities:** 1) Making conversation and taking turns  
2) Oral description or explanation of a common object, situation or concept

**SECTION-D**

The study of sounds of English,  
Stress and Intonation,  
Situation based Conversation in English,  
Essentials of Spoken English.

**Activities:** Giving Interviews

**PRACTICAL / ORAL TESTING**

**Marks: 15**

**Course Contents:-**

1. Oral Presentation with/without audio visual aids.
2. Group Discussion.
3. Listening to any recorded or live material and asking oral questions for listening comprehension.

**Questions:-**

1. Oral Presentation will be of 5 to 10 minutes duration (Topic can be given in advance or it can be student's own choice). Use of audio visual aids is desirable.
2. Group discussion comprising 8 to 10 students on a familiar topic. Time for each group will be 15 to 20 minutes.

**Note:** Oral test will be conducted by external examiner with the help of internal examiner.

Bachelor of Vocation (B.Voc.)  
(Nutrition and Diet Planning) (Semester-II)

**Paper-II: ਪੰਜਾਬੀ (ਲਾਜ਼ਮੀ)**

ਸਮਾਂ : 3 ਘੰਟੇ

ਕੁਲ ਅੰਕ : 50

**ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ**

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਭਾਗ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਇੱਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਭਾਗ ਵਿੱਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿੱਚ ਕਰ ਸਕਦਾ ਹੈ।

**ਪਾਠ-ਕ੍ਰਮ ਅਤੇ ਪਾਠ-ਪੁਸਤਕਾਂ**

**ਸੈਕਸ਼ਨ-ਏ**

ਆਤਮ ਅਨਾਤਮ (ਕਹਾਣੀ ਭਾਗ),  
(ਸੰਪ. ਸੁਹਿੰਦਰ ਬੀਰ ਅਤੇ ਵਰਿਆਮ ਸਿੰਘ ਸੰਧੂ)  
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ।  
(ਵਿਸ਼ਾ-ਵਸਤੂ, ਪਾਤਰ ਚਿਤਰਨ)

**ਸੈਕਸ਼ਨ-ਬੀ**

ਇਤਿਹਾਸਕ ਯਾਦਾਂ (ਇਤਿਹਾਸਕ ਲੇਖ-ਸੰਗ੍ਰਹਿ)  
ਸੰਪਾ. ਸ.ਸ.ਅਮੋਲ,  
ਪੰਜਾਬੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ, ਲੁਧਿਆਣਾ। (ਲੇਖ 7 ਤੋਂ 12)  
(ਸਾਰ, ਲਿਖਣ ਸ਼ੈਲੀ)

**ਸੈਕਸ਼ਨ-ਸੀ**

(ੳ) ਸ਼ਬਦ-ਬਣਤਰ ਅਤੇ ਸ਼ਬਦ ਰਚਨਾ : ਪਰਿਭਾਸ਼ਾ, ਮੁੱਢਲੇ ਸੰਕਲਪ  
(ਅ) ਸ਼ਬਦ ਸੂਚੀ

**ਸੈਕਸ਼ਨ-ਡੀ**

(ੳ) ਸੰਖੇਪ ਰਚਨਾ  
(ਅ) ਮੁਹਾਵਰੇ ਅਤੇ ਅਖਾਣ

Bachelor of Vocation (B.Voc.)  
(Nutrition and Diet Planning) (Semester-II)

**Paper-II: ਮੁੱਢਲੀ ਪੰਜਾਬੀ**  
(In lieu of Compulsory Punjabi)

ਸਮਾਂ: 3 ਘੰਟੇ

ਕੁਲ ਅੰਕ: 50

ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਭਾਗ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਭਾਗ ਵਿੱਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

ਪਾਠ-ਕ੍ਰਮ

ਸੈਕਸ਼ਨ-ਦੇ

ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ : ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ  
(ਨਾਂਵ, ਪੜਨਾਂਵ, ਕਿਰਿਆ, ਵਿਸ਼ੇਸ਼ਣ, ਕਿਰਿਆ ਵਿਸ਼ੇਸ਼ਣ, ਸਬੰਧਕ, ਯੋਜਕ ਅਤੇ ਵਿਸਮਿਕ)

ਸੈਕਸ਼ਨ-ਬੀ

ਪੰਜਾਬੀ ਵਾਕ ਬਣਤਰ : ਮੁੱਢਲੀ ਜਾਣ-ਪਛਾਣ  
(ੳ) ਸਾਧਾਰਨ ਵਾਕ, ਸੰਯੁਕਤ ਵਾਕ ਅਤੇ ਮਿਸ਼ਰਤ ਵਾਕ (ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ)  
(ਅ) ਬਿਆਨੀਆ ਵਾਕ, ਪ੍ਰਸ਼ਨਵਾਚਕ ਵਾਕ ਅਤੇ ਹੁਕਮੀ ਵਾਕ (ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ)

ਸੈਕਸ਼ਨ-ਸੀ

ਪੈਰਾ ਰਚਨਾ  
ਸੰਖੇਪ ਰਚਨਾ

ਸੈਕਸ਼ਨ-ਡੀ

ਚਿੱਠੀ ਪੱਤਰ (ਘਰੇਲੂ ਅਤੇ ਦਫ਼ਤਰੀ)  
ਅਖਾਣ ਅਤੇ ਮੁਹਾਵਰੇ

Bachelor of Vocation (B.Voc.)  
(Nutrition and Diet Planning) (Semester-II)

**Paper-II: Punjab History & Culture (C 320 to 1000 B.C.)**  
(Special Paper in lieu of Punjabi compulsory)  
(For those students who are not domicile of Punjab)

**Time: 3 Hours**

**Max. Marks : 50**

**Instructions for the Paper Setters:-**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**Section A**

1. Alexander's Invasion and its Impact
2. Punjab under Chandragupta Maurya and Ashoka.

**Section B**

3. The Kushans and their Contribution to the Punjab.
4. The Panjab under the Gupta Empire.

**Section C**

5. The Punjab under the Vardhana Emperors
6. Socio-cultural History of Punjab from 7<sup>th</sup> to 1000 A.D.

**Section D**

7. Development of languages and Education with Special reference to Taxila
8. Development of Art & Architecture

**Suggested Readings**

1. L. M Joshi (ed), *History and Culture of the Punjab*, Art-I, Punjabi University, Patiala, 1989 (3<sup>rd</sup> edition)
2. L.M. Joshi and Fauja Singh (ed.), *History of Punjab* , Vol.I, Punjabi University, Patiala, 1977.
3. Budha Parkash, *Glimpses of Ancient Punjab*, Patiala, 1983.
4. B.N. Sharma: *Life in Northern India*, Delhi. 1966.

Bachelor of Vocation (B.Voc.)  
(Nutrition and Diet Planning) (Semester-II)

**Paper-III: Drug Abuse: Problem, Management and Prevention  
(COMPULSORY PAPER)**

**DRUG ABUSE: MANAGEMENT AND PREVENTION**

**Time: 3 Hours**

**Max. Marks: 50**

**Instructions for the Paper Setters:-**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**Section – A**

**Prevention of Drug abuse:**

Role of family: Parent child relationship, Family support, Supervision, Shaping values, Active Scrutiny.

**Section – B**

School: Counselling, Teacher as role-model. Parent-teacher-Health Professional Coordination, Random testing on students.

**Section – C**

**Controlling Drug Abuse:**

Media: Restraint on advertisements of drugs, advertisements on bad effects of drugs, Publicity and media, Campaigns against drug abuse, Educational and awareness program

**Section – D**

Legislation: NDPs act, Statutory warnings, Policing of Borders, Checking Supply/Smuggling of Drugs, Strict enforcement of laws, Time bound trials.

**References:**

1. Ahuja, Ram (2003), *Social Problems in India*, Rawat Publication, Jaipur.
2. Extent, Pattern and Trend of Drug Use in India, Ministry of Social Justice and Empowerment, Government of India, 2004.
3. Inciardi, J.A. 1981. *The Drug Crime Connection*. Beverly Hills: Sage Publications.
4. Kapoor. T. (1985) *Drug epidemic among Indian Youth*, New Delhi: Mittal Pub.
5. Kessel, Neil and Henry Walton. 1982, *Alcoholism*. Harmond Worth: Penguin Books.
6. Modi, Ishwar and Modi, Shalini (1997) *Drugs: Addiction and Prevention*, Jaipur: Rawat Publication.

Bachelor of Vocation (B.Voc.)  
(Nutrition and Diet Planning) (Semester-II)

7. National Household Survey of Alcohol and Drug abuse. (2003) New Delhi, Clinical Epidemiological Unit, All India Institute of Medical Sciences, 2004.
8. Ross Coomber and Others. 2013, *Key Concept in Drugs and Society*. New Delhi: Sage Publications.
9. Sain, Bhim 1991, *Drug Addiction Alcoholism, Smoking obscenity* New Delhi: Mittal Publications.
10. Sandhu, Ranvinder Singh, 2009, *Drug Addiction in Punjab: A Sociological Study*. Amritsar: Guru Nanak Dev University.
11. Singh, Chandra Paul 2000. *Alcohol and Dependence among Industrial Workers*: Delhi: Shipra.
12. Sussman, S and Ames, S.L. (2008). *Drug Abuse: Concepts, Prevention and Cessation*, Cambridge University Press.
13. Verma, P.S. 2017, "*Punjab's Drug Problem: Contours and Characteristics*", Economic and Political Weekly, Vol. LII, No. 3, P.P. 40-43.
14. World Drug Report 2016, United Nations office of Drug and Crime.
15. World Drug Report 2017, United Nations office of Drug and Crime.

Bachelor of Vocation (B.Voc.)  
(Nutrition and Diet Planning) (Semester-II)

**Paper-IV: FOOD PRESERVATION AND STORAGE (THEORY)**

**Time: 3 Hours**

**Max. Marks: 120**

**Theory: 50**

**Practical: 70**

**Instructions for the Paper Setters:-**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**Course Content**

**SECTION-A**

- Definition, scope and importance of food preservation. Classification of food on the basis of shelf life.
- Food spoilage: cause and effects.

**SECTION-B**

- Principles of food preservation.
- Methods of food preservation

**SECTION-C**

- Storage of common perishable, semi-perishable and non-perishable foods.
- Selection and purchase of foods for preservation.

**SECTION-D**

- Packaging and packing materials, labeling and costing of products.
- Food additives, preservatives, anti-oxidants, coloring matter and emulsifying agents.

**Suggested Readings:-**

1. Muller, H.G. (1981). Fundamentals of Foods and Nutrition. New Delhi, Wiley Eastern Pvt Ltd.
2. Desrosier, N.W. (1970). The Technology of Food Preservation. 3<sup>rd</sup> ed., Westport, AVI.

Bachelor of Vocation (B.Voc.)  
(Nutrition and Diet Planning) (Semester-II)

**PAPER-IV : FOOD PRESERVATION AND STORAGE (Practical)**

**Marks: 70**

- **Preparation and storage of:**
  - a) Squashes and syrups
  - b) Jams and jellies
  - c) Marmalades and preserves
  - d) Ketchup/sauces and chutneys
  - e) Pickles (with and without oil).
  
- Preparation of items utilizing cereals and legumes and their storage.
- Demonstration of canning and bottling of fruits and vegetables.
- Visit to food industry.



Bachelor of Vocation (B.Voc.)  
(Nutrition and Diet Planning) (Semester-II)

**Paper-V: NUTRITIONAL BIOCHEMISTRY (Theory)**

**Time: 3 Hours**

**Max. Marks: 130**

**Theory : 80**

**Practical : 50**

**Instructions for the Paper Setters:-**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**Course Content**

**SECTION-A**

- Biochemistry, its scope and importance in foods and nutrition.
- Carbohydrates: Digestion, absorption and metabolism of carbohydrates. Anaerobic and aerobic pathways, glycolysis, citric acid cycle, glycogenesis, glyconeogenesis, pentose-phosphate pathway, glycogenesis, glycogenolysis, glucose transport, metabolism of lactate and pyruvate (in brief).

**SECTION-B**

- Fats and Lipids: Digestion, absorption and metabolism of fats and fatty acids, beta-oxidation of fatty acids, biosynthesis of fatty acids, energy yield from dietary fats, storage, mobilization of fat stores during exercise, production of ketone bodies and ketogenic diets, metabolism of phospholipids, glycolipids and cholesterol (in brief).
- Proteins: Digestion, absorption and metabolism (in brief).

**SECTION-C**

- Energy: BMR, Factors affecting BMR, energy requirements for physical activity, relative body weight and influence of physical exercise on changes in body fat and body composition, utilization of energy by muscle tissue in relation to exercise type, intensity and duration.
- Hormones: Classification, general mode of action, hormones of pituitary, thyroid, parathyroid, adrenals, reproductive glands and pancreas. Hormonal disorders, counter regulatory hormones.

**SECTION-D**

- Enzymes: Definition, classification, specificity of enzymes and factors affecting enzyme activity.
- Acid base balance: Concepts and disorders, pH, buffers, acidosis, alkalosis.
- Water and electrolyte balance.
- Biochemical functions of minerals and vitamins.
- Role of anti-nutrients and anti-oxidants in human health

Bachelor of Vocation (B.Voc.)  
(Nutrition and Diet Planning) (Semester-II)

**Suggested Readings:**

1. Rao, K.R. (1986). Textbook of Biochemistry, III ed. Prentice Hall of India Pvt. Ltd. ND-110001.
2. Murray, R.K. and Rodwell, V.W. (1988). Harper's Biochemistry 21<sup>st</sup> ed. Prentice Hall of Australia Pvt. Ltd.
3. Lehninger, A.L. (1987). Principles of Bio-Chemistry, CBS Publishers and Distribution.
4. Qrten, J.M. and Neuhans, O.W. (1982). Human Bio-Chemistry, The C.V. Mosby Co., Toronto, London, 10<sup>th</sup> ed.

Bachelor of Vocation (B.Voc.)  
(Nutrition and Diet Planning) (Semester-II)

**Paper-V: NUTRITIONAL BIOCHEMISTRY (Practical)**

**Marks: 50**

- Estimation of reducing sugars.
- Determination of pH in various food stuffs.
- Estimation of cholesterol
- Estimation of blood glucose
- Estimation of glucose in urine

Bachelor of Vocation (B.Voc.)  
(Nutrition and Diet Planning) (Semester-II)

**Paper-VI: NUTRITION & IMMUNITY (Theory)**

**Time: 3 Hours**

**Max. Marks: 50**

**Instructions for the Paper Setters:-**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**COURSE CONTENTS**

**SECTION-A**

- Immune system : The defense mechanisms of the body
- Role of nutrients in immune functions. Under nutrition-causes and consequences.
- Infection : Risk of infection. Influence of infections on nutrition and susceptibility to infection.

**SECTION-B**

- Role of nutrients in prevention of risk of infections.
- Childhood mortality associated with infections diseases of gastro-intestinal tract and lungs.
- Age related immune depression.

**SECTION-C**

- Role of nutraceuticals and functional foods.
- Nutrition, HIV/AIDS and tuberculosis.

**SECTION-D**

- Probiotics, Prebiotics and Immunity.
- Food allergy.

**Suggested Readings :**

1. Barasi Mary, E. (1997), Human Nutrition-A health perspective, Arnold International Student's edition, U.K.
2. Gershwin, M.E., Nestel, P. and Keen, C.L. (2004), Handbook of Nutrition and Immunity, Humana Publishers, USA.
3. Owen. J. and Stanford, S. (2013), Kuby Immunology : International Edition, Macmillan Publishers, USA.
4. Prason, S.K. and Poddar, T. (2012), Perfect Health-Body Diet and Nutrition, V & S Publishers, New Delhi.

Bachelor of Vocation (B.Voc.)  
(Nutrition & Diet Planning) (Semester-III)

**Paper-I: COMPUTER FUNDAMENTALS (THEORY)**

**Time: 3 Hours**

**Max. Marks: 100**

**Theory: 40**

**Practical: 60**

**Instructions for the Paper Setters:-**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**Course Content - Same for theory and practical as well.**

**SECTION-A**

- **Introduction to Windows:-** Basics, Windows Accessories, using file and program
- **MS-Word:** Overview, creating, saving, opening, importing, exporting and inserting files, Manager. Formatting pages, paragraphs and sections, indents and outdents, creating lists and numbering. Headings, styles, fonts and font size editing, positioning and viewing texts, finding and replacing text, inserting page breaks, page numbers, book marks, symbols

**SECTION-B**

- **MS-Power Point:** Presentation Overview, entering information, presentation creation and dates. Using tabs and tables, header, footer and printing. opening and saving presentation, power point elements, exploring power point menu, working with dialog boxes, saving presentation, printing slides view, slide sorter view, notes view, outline view, formatting and enhancing text formatting, inserting audio and video.

**SECTION-C**

- **MS-Excel:** overview, creating, saving and opening of sheets. Data analysis using different statistical parameters.

**SECTION-D**

- **Internet:** Internet and its working, working of WWW, Web browsing (opening, viewing, saving and printing web page and bookmark), search engines.

**Suggested readings:**

1. R.K Taxali: Introduction to software packages, Galgotia Publications.
2. MS-Office 2003, BPB Publications.

Bachelor of Vocation (B.Voc.)  
(Nutrition & Diet Planning) (Semester-III)

**Paper-I: COMPUTER FUNDAMENTALS (PRACTICAL)**

**Time : 3 Hrs.**

**Max. Marks 60**

**Note : Instructions for Practical Exam :**

1. Entire theory paper will be covered for practical.
2. Practical Paper will be set on the spot.

Bachelor of Vocation (B.Voc.)  
(Nutrition & Diet Planning) (Semester-III)

**Paper-II: FOOD TOXICOLOGY (THEORY)**

**Time: 3 Hours**

**Max. Marks: 50**

**Instructions for the Paper Setters:-**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**Course Content**

**SECTION-A**

- Introduction and significance of food toxicology. Types, causative agents, symptoms and preventive measures of food poisoning.
- Natural food toxins. Anti-nutritional factors, fungal and seafood toxins, goiterogens and carcinogens, their harmful effects and methods of removal.

**SECTION-B**

- Concept of microbial toxins and food intoxication.
- Sources of food contamination, effect on health, preventive measures and methods of inactivation/destruction.

**SECTION-C**

- Food packaging material and potential contaminants.
- Hazards of plastic packaging during storage and transportation and their effect on health.

**SECTION-D**

- Relevance of microbial standards for food safety.
- Microbial intoxication and infections: Sources of contamination of food by pathogenic organisms, symptoms and methods of control.

**Suggested Readings:**

1. Gaman, P.M. (1979). The Science of Food: An Introduction to Food Science, Nutrition and Microbiology. Pregamon Press, Oxford.
2. Barasi Mary, E. (1997). Human Nutrition-A health perspective. Arnold International Student's edition, U.K.
3. Hatchcock, J.N. and Coon, J. Eds. (1978). Nutrition and Drug Inter-relations. Academic Press, New York.
4. Howe, P.S. (1981). Basic Nutrition in Health and Disease. 7<sup>th</sup> ed. W B Saunders Co, Philadelphia.
5. Winick, M. (1981). Nutrition and Drugs. John Wiley and Sons, New York.

Bachelor of Vocation (B.Voc.)  
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**Paper-III: FOOD MICROBIOLOGY (Theory)**

**Time: 3 Hours**

**Max. Marks: 100**

**Theory : 75**

**Practical : 25**

**Instructions for the Paper Setters:-**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**Course Content**

**SECTION-A**

1. Introduction of microbiology and its relevance to everyday life, general Characteristics of bacteria, fungi, virus, protozoa and algae.

**SECTION-B**

2. Growth of microorganisms: Growth curve, effect of environmental factors in growth of microorganism, pH, water activity, oxygen availability, temperature and others.
3. Microbiology of different foods: Spoilage and contamination, sources, types, effect on the following:
  - i. Cereal and cereal products
  - ii. Sugar and salt
  - iii. Vegetables and fruits
  - iv. Meat and meat products
  - v. Fish, egg and poultry
  - vi. Milk and milk products
  - vii. Canned foods.

**SECTION-C**

4. Environmental microbiology :
  - (a) Water and water borne diseases
  - (b) Air and air borne diseases
  - (c) Soil and soil borne disease
  - (d) Sewage and diseases

**SECTION-D**

5. Beneficial effect of microorganisms.
  - Fermented foods: Bread, malt beverages.
  - Role of microorganisms in fermented milk products: Butter and cheese etc.



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**Suggested readings:**

1. Frailer ,W.C., “Food Microbiology”, 4<sup>th</sup> Ed .1988 McGraw Hill, New York
2. Kawata ,K. “ Environmental Sanitation in India “ ,1963, Lucknow Publ . House
3. Pelezer ,H.J. and Rober ,D., “Microbiology “, 2<sup>nd</sup> Ed . 1968, McGraw Hill, New York
4. Banwart , G.T. “Basic Food Microbiology “, 1987 CBS Publ., New Delhi
5. Jay ,J.H.,” Modern Microbiology”, CBS Publ., New Delhi
6. Joshua ,A.K “Microbiology “ popular Book Depo, Madras 1988
7. Carpenter , “Microbiology “-W.B Saunders Co., London
8. West wood and Harger , “ Food Service in institution “, 1966 , John Wiley and sons, intcorporation , New York,London.
9. Simith and Water ,” Introductory Food Services “, McGraw Hill Book Co. , New York, 1975
10. Salie , A.J ,” Fundamentals Principals of Bacteriology “ McGraw Hill Book Co.
11. Vash Pal Bedi , “ Social And Preventive Medicine “-Arma Ram & Co. Delhi
12. Mackmill AND Mac Carney “Handbook of Practical Bacteriology “, William and Wilkins Company , Baltimore.

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**PAPER-III: FOOD MICROBIOLOGY (PRACTICAL)**

**Time : 3 Hrs.**

**Marks: 25**

**Note : Instructions for Practical Exam :**

1. Entire theory paper will be covered for practical.
2. Practical Paper will be set on the spot.

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**Paper-IV: FOOD SCIENCE-I (Theory)**

**Time: 3 Hours**

**Max. Marks 150**

**Theory : 75**

**Practical : 75**

**Instructions for the Paper Setters:** Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Unit (I-IV). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Unit. The fifth question may be attempted from any Unit.

**Course Content**

**SECTION-A**

1. Cereal and cereal products: Cereals and millets, breakfast cereals, cereal products. Microscopic structure of various starch granules-nutritive value of rice, wheat and locally available millets. Processing of cereals, milling, parboiling, effect of processing and cooking on the nutritive value of cereals, dextrinization, gelatinisation, gluten formation. Storage of cereals, contamination preservation and cost.

**SECTION-B**

2. Pulses, legumes and nuts: Production (in brief), selection and variety, composition– nutritive value of grams, dhals, processing, use in a variety of preparations, some common nuts, meat substitutes- soya products, textured vegetable protein (TVP) and cost. Toxic substances – *lathyrus sativus* goitrogens, *Aspergillus* flavours.

**SECTION-C**

3. Milk and milk products- composition, classification, properties, quality processing, nutritive value of milk, butter, curd, butter milk, khoa, cheese, ice-cream and various kinds of milk–processed milk, dried milk, evaporated milk , condensed milk products, storage, preservation, spoilage and cost. Eggs- structure, composition, production, grade, quality, selection, nutritive value, principles of food cookery –uses of egg in cookery, methods of cooking eggs, storage, spoilage, use and cost. Fish, Poultry and Meat – classification, selection, purchase, uses. Nutritive value, method of cooking, spoilage of fish, poultry and meat.

**SECTION-D**

4. Vegetables and Fruits – classification, composition and nutritive value. Methods to minimize the loss of nutrients, colour, texture, flavor, browning reaction, selection, purchase, storage and availability, cost and use, methods of cooking and changes during cooking, nutritional aspects of raw and processed vegetables and fruits.

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**Suggested Readings:**

1. Charley ,Helen ,1970 "Food Science " – John Wiley& Sons , New York
2. Griswold C., R.H. "The Experimental Study of Foods ". Houghton Mifflin Co, Boston
3. Hughes, O. " Introductory Foods", Macmillan & Co, New York
4. Pan and Palamer, "Food Theory and Application ", John Wiley and Sons, New York.
5. Swaminathan, M "Food Science and Experimental Foods ", Ganesh & Co,Madras.
6. Brain A. Fox and Allan G. Cameron,1989, " Food Science , Nutrition and Health ", 5<sup>th</sup> Edition ,Edward Arnold
7. Mudambi S.R. and S.M. Rao, "Food Science ", Wiley Eastern LTD, New Delhi, Bangalore, Bomby, Calcutta, Madras, Hyderabad.
8. Devis, B " Food Commodities - Heinman Professional Publishing, Great Britain

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**PAPER-IV : FOOD SCIENCE-I (PRACTICAL)**

**Time : 4 Hrs.**

**Marks: 75**

- Preparations from cereals - e.g. boiled rice, rice, pulao, chapati, puri, paratha, sandwiches, pastas, pancakes, cookies and cake.
- Preparations from pulses- e.g. dal makhni, sambar, chana masala, rajmah etc.
- Preparations from vegetables (dry, curries, koftas)- e.g. mixed vegetable, gobhi masala, vegetable kofta etc.
- Preparations from milk- e.g. Porridge, curd/raita, paneer dishes, desserts and puddings- custard, kheer, ice cream.
- Preparations from meat, fish and egg.
- Soups- Basic, clear and cream soups.
- Salads with and without dressing.
- Beverages- preparation of nourishing and refreshing beverages.
- Snacks – pakoras, cutlets, cheese toast , upma , poha, peanut chikki, til laddo.
- Use of leftover foods.

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(Nutrition & Diet Planning) (Semester-IV)

**Paper-I: HUMAN VALUES IN EDUCATION (THEORY)**

**Time: 3 Hours**

**Max. Marks: 100**

**Instructions for the Paper Setters:-**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**Course Content**

**SECTION-A**

- Universal human aspirations: Happiness and prosperity.
- Human values and ethics: Concept, definition, significance and sources.
- Fundamental values: Right conduct, peace, truth, love and non violence.

**SECTION-B**

- Ethics: Professional, environmental, ICT.
- Sensitization towards others particularly senior citizens, developmentally challenged and gender.

**SECTION-C**

- Spirituality, positive attitude and scientific temper.
- Team work and volunteering. Rights and responsibilities.
- Road safety- initiatives, measures and hurdles. Traffic rules, road rage.

**SECTION-D**

- Human relations and family harmony.
- Modern challenges and value conflict.

**Suggested readings:**

1. Tripathi, A. N. (2009). Human values. New Age Publishers, New Delhi.
2. Gaur, R.R., Sangal, R. and Bagaria, G.P. (2010). A Foundation course in Human Values and Professional ethics. Excel Books Publishers, New Delhi.
3. Gogate, S.B. (2010). Human Values and Professional Ethics. New Age Publishers, New Delhi.

Bachelor of Vocation (B.Voc.)  
(Nutrition & Diet Planning) (Semester-IV)

**Paper-II: MEAL MANAGEMENT (Theory)**

**Time: 3 Hours**

**Max. Marks: 125**

**Theory : 75**

**Practical : 50**

**Instructions for the Paper Setters:-**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**SECTION-A**

- Introduction to meal management: Balanced diet, food groups, food guide and food pyramid, exchange list. Food faddism & the faulty food habits.
- Basic principles of meal planning, objectives, steps in meal planning, food cost.
- Indian meal patterns: Vegetarian & non-vegetarian.

**SECTION-B**

- Recommended dietary allowances (RDA) for Indians and factors affecting these *viz.*, age, sex, physical activity and physiological state.
- Nutritional and food requirements for adult man & woman- sedentary, moderate and heavy worker and considerations while planning diet for him.
- Nutritional and food requirements for pregnant & teaching woman and considerations while planning for her diet, with special reference to these periods complications in pregnancy.

**SECTION-C**

- Nutritional and food requirements for lactating mother and considerations with special reference to different periods of lactation.
- Nutritional and food requirements for an infant and considerations while planning diet:
  - a) Breast feeding-Advantages and dis advantages, feeding patterns and technique.
  - b) Infant formula
  - c) Weaning-Definition, time, importance and steps.
  - d) Introduction of supplementary food.
- Nutritional and food requirements during early childhood (toddlers and preschoolers) and considerations for planning their diet with special reference to their growth need.

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**SECTION-D**

- Nutritional and food requirements for school going and planning diet with special reference to importance of school lunch and snacks.
- Nutritional and food requirements for adolescent girl and boy and considerations while planning diet for them with special reference to their growth need and eating habits.
- Nutritional and food requirements for old age and considerations for planning their diet.
- Nutritional and food requirements for an athlete and considerations for planning diet.

1

**Suggested readings:**

1. Guthrie, H.A. et al. (1986). Introductory Nutrition. 6<sup>th</sup> ed. Times Mirror/Mosby College Pub. St. Louis.
2. Anderson, L. et al. (1982). Nutrition in Health and Disease. 17<sup>th</sup> ed. J.B. Lippincott co. Philadelphia.
3. Recommended Dietary Intakes for Indians, I.C.M.R. (1989).
4. Guthrie, H.A. (1989). Introductory Nutrition. 6<sup>th</sup> ed. Times Mirror/Mosby College Publ.- St. Louis.
5. Worthington, R., Bonnie S. et al. (1985). Nutrition in Pregnancy & Lactation. 3<sup>rd</sup> ed. Times Mirror/Mosby College, St. Louis.



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**PAPER-II: MEAL MANAGEMENT (PRACTICAL)**

**Time : 5 Hrs.**

**Marks: 50**

- Plan a day's diet for the following age groups and calculate energy, carbohydrates, protein, fat and one important vitamin or mineral as per requirement for the given age group.
  - a) Adult man- sedentary, moderate and heavy worker
  - b) Adult woman- sedentary, moderate and heavy worker
  - c) Pregnant woman
  - d) Lactating woman
  - e) Infant-weaning food
  - f) Preschool child
  - g) School going
  - h) Adolescent boy
  - i) Adolescent girl
  - j) Old age
  - k) Athlete
  
- To prepare any three weaning foods.

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**Paper-III: INSTITUTIONAL FOOD SERVICE MANAGEMENT (Theory)**

**Time: 3 Hours**

**Max. Marks: 125**

**Theory Marks: 75**

**Practical Marks: 50**

**Instructions for the Paper Setters:-**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**Course Content**

**Theory**

**SECTION-A**

- Types of food service institutions. Styles of food services.
- Planning, writing, types and preparation of menu and menu cards. Menu display.

**SECTION-B**

- Floor planning and layout.
- Principles, functions and tools of management.

**SECTION-C**

- Food material management: Meaning definition and importance. Selection, purchase and storage of food. Control in relation to these operations (material planning, budgeting, material standardization, inventory control).

**SECTION-D**

- Store keeping: Definition, objectives, functions, factors underlying successful storekeeping, duties and responsibilities of a storekeeper, purchasing, organization, principles, procedure, systems and quality control.

**Suggested Readings:**

1. Bora, P.M. (1982). Food administration in India. A study of an Indian State.
2. Boella, M.J. (1974). Personnel management in the hotel and catering industry. 1<sup>st</sup> ed. Bassie and Jenhis, London.
3. Kiesan, J. (1986). Controlling, analyzing costs in food service operations. 2<sup>nd</sup> ed. MacMillan Publishing Company.
4. Kumar, H.L. (1986). Personnel management in the hotel and catering industry. Metropolitan Book Co., Delhi.
5. Minor, L.J. and Cichy, R.F. (1984). Food service systems management. Avi Publishing Co., Connecticut.
6. Sethi, M. and Malhan, S. (1987). Catering management-an integrated approach. Wiley Eastern Ltd.

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(Nutrition & Diet Planning) (Semester-IV)

**PAPER-III : INSTITUTIONAL FOOD SERVICE MANAGEMENT (Practical)**

**Time : 4 Hrs.**

**Marks: 50**

- Standardization of recipes of snacks and a meal for portion and cost.
- Preparation of various types of menu cards.
- Table setting, tray service of tea and snacks of tea and snacks for 25 persons.
- Serving high tea to 20 persons and a meal to 10 persons.
- Preparation and service of packed lunch.
- Planning and preparation of diets for special occasion's birthdays and festivals.
- Visit to any two food service institutions (Hospitals, flight kitchen, hotel, restaurant, canteen, industry).

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**Paper-IV: FOOD SCIENCE-II (Theory)**

**Time : 3 Hrs.**

**Max. Marks : 50**

**Instructions for the Paper Setters:-**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**Course Content**

**SECTION-A**

- Sugar and sugar products- Different types of sugar (Sugar, Jaggery, honey, syrup). Manufacture, selection, storage and use as preservative.
- Fats and oils-types, saturated, MUFA, PUFA, sources of fats and oil (animal and vegetables), hydrogenation, invisible fats, use of fat in cookery, factors affecting absorption of fats, smoking point, rancidity, uses, storage cost and nutritional aspects.
- Raising agents- types, constituents, use in cookery and bakery.

**SECTION-B**

- Food adjuncts- spices, condiments, herbs, extracts, concentrates and food colours- origin, classification, description, uses in Indian cookery.
- Convenience foods- role, types, advantages, uses, cost and contribution to diet.
- Salt, types, uses in the diet
- Tea, coffee, chocolate and cocoa powder, processing, use, cost and nutritional aspects.
- Effect of pH on foods.

**SECTION-C**

- Importance of quality control and assurance.
- Food adulteration: Common food adulterants, consumer awareness, domestic methods of identification and prevention.
- Food laws and regulations-prevention of Food Adulteration Act , Fruit Product Order, Agmark, Essential Commodity Act and Consumer protection and Bureau of Indian Standard, Codex Standards, Hazard analysis and critical control point.

**SECTION-D**

- Sampling procedure.
- Application of food standards, sampling and specifications for raw foods and food products for additives, preservatives, coloring matters, anti-oxidants, emulsifying and stabilizing agents.
- Various methods for the assessment of quality of different foods.
- Selection of sensory panel and sensory evaluation of food products.
- Grading and marketing standards, specifications of finished products.
- Market survey of processed foods for quality assurance.

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**Suggested Readings:**

1. Guide to Food Safety and Quality during Transportation: Controls, Standards Practices by John M. Ryan Kindle Edition - 30 December 2013.
2. International Standards for Food Safety, By Naomi Rees (Author), David Watson.
3. ISO 22000 Standard Procedures for Food Safety Management Systems by Bizmanualz
4. Food Safety Management: A Practical Guide for the Food Industry By Yasmine Moterjami, Kindle Edition.

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**PAPER-I : ESL-221 : Environmental Studies (Compulsory Paper)**

**Time: 3 Hrs.**

**Max. Marks: 100**

**Teaching Methodologies**

The Core Module Syllabus for Environmental Studies includes class room teaching and field work. The syllabus is divided into 8 Units [Unit-1 to Unit-VII] covering 45 lectures + 5 hours for field work [Unit-VIII]. The first 7 Units will cover 45 lectures which are class room based to enhance knowledge skills and attitude to environment. Unit-VIII comprises of 5 hours field work to be submitted by each candidate to the Teacher in-charge for evaluation latest by 15 December, 2019.

**Exam Pattern:**           **End Semester Examination- 75 marks**  
                                  **Project Report/Field Study- 25 marks [based on submitted report]**  
                                  **Total Marks- 100**

The structure of the question paper being:

**Part-A, Short answer pattern with inbuilt choice – 25 marks**

Attempt any five questions out of seven distributed equally from Unit-1 to Unit-VII. Each question carries 5 marks. Answer to each question should not exceed 2 pages.

**Part-B, Essay type with inbuilt choice – 50 marks**

Attempt any five questions out of eight distributed equally from Unit-1 to Unit-VII. Each question carries 10 marks. Answer to each question should not exceed 5 pages.

**Project Report / Internal Assessment:**

**Part-C, Field work – 25 marks [Field work equal to 5 lecture hours]**

The candidate will submit a hand written field work report showing photographs, sketches, observations, perspective of any topic related to Environment or Ecosystem. The exhaustive list for project report/area of study are given just for reference:

1. Visit to a local area to document environmental assets: River / Forest/ Grassland / Hill / Mountain / Water body / Pond / Lake / Solid Waste Disposal / Water Treatment Plant / Wastewater Treatment Facility etc.
2. Visit to a local polluted site – Urban / Rural / Industrial / Agricultural
3. Study of common plants, insects, birds
4. Study of tree in your areas with their botanical names and soil types
5. Study of birds and their nesting habits
6. Study of local pond in terms of wastewater inflow and water quality
7. Study of industrial units in your area. Name of industry, type of industry, Size (Large, Medium or small scale)
8. Study of common disease in the village and basic data from community health centre
9. Adopt any five young plants and photograph its growth
10. Analyze the Total dissolved solids of ground water samples in your area.
11. Study of Particulate Matter (PM<sub>2.5</sub> or PM<sub>10</sub>) data from Sameer website. Download from Play store.
12. Perspective on any field on Environmental Studies with secondary data taken from Central Pollution Control Board, State Pollution Control Board, State Science & Technology Council etc.

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**Unit-I**

**The multidisciplinary nature of environmental studies**

Definition, scope and importance, Need for public awareness

**(2 lectures)**

**Unit-II**

**Natural Resources: Renewable and non-renewable resources:**

Natural resources and associated problems.

- (a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
- (b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
- (c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
- (d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.
- (e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies.
- (f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.
  - Role of an individual in conservation of natural resources.
  - Equitable use of resources for sustainable lifestyles.

**(8 Lectures)**

**Unit-III**

**Ecosystems**

- Concept of an ecosystem
- Structure and function of an ecosystem
- Producers, consumers and decomposers
- Energy flow in the ecosystem
- Ecological succession
- Food chains, food webs and ecological pyramids
- Introduction, types, characteristic features, structure and function of the following ecosystem: Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, ocean estuaries)

**(6 Lectures)**

**Unit-IV**

**Biodiversity and its conservation**

- Introduction – Definition: genetic, species and ecosystem diversity
- Biogeographical classification of India
- Value of biodiversity: consumptive use, productive use, social, ethical aesthetic and option values
- Biodiversity at global, national and local levels
- India as a mega-diversity nation
- Hot-spots of biodiversity
- Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts
- Endangered and endemic species of India
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity

**(8 Lectures)**

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**Unit-V**

**Environmental Pollution**

Definition

- Causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear pollution
- Solid waste management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution
- Pollution case studies
- Disaster management: floods, earthquake, cyclone and landslides

**(8 Lectures)**

**Unit-VI**

**Social Issues and the Environment**

- From unsustainable to sustainable development
- Urban problems and related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns. Case studies.
- Environmental ethics: Issues and possible solutions
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
- Wasteland reclamation
- Consumerism and waste products
- Environmental Protection Act, 1986
- Air (Prevention and Control of Pollution) Act, 1981
- Water (Prevention and control of Pollution) Act, 1974
- Wildlife Protection Act
- Forest Conservation Act
- Issues involved in enforcement of environmental legislation
- Public awareness

**(7 Lectures)**

**Unit-VII**

**Human Population and the Environment**

- Population growth, variation among nations
- Population explosion – Family Welfare Programmes
- Environment and human health
- Human Rights
- Value Education
- HIV / AIDS
- Women and Child Welfare
- Role of Information Technology in Environment and Human Health
- Case Studies

**(6 Lectures)**



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**Unit-VIII**

**Field Work**

- Visit to a local area to document environmental assets  
river/forest/grassland/hill/mountain
- Visit to a local polluted site – Urban / Rural / Industrial / Agricultural
- Study of common plants, insects, birds
- Study of simple ecosystems-pond, river, hill slopes, etc

**(Field work equal to 5 lecture hours)**

**References:**

1. Bharucha, E. 2005. Textbook of Environmental Studies, Universities Press, Hyderabad.
2. Down to Earth, Centre for Science and Environment, New Delhi.
3. Heywood, V.H. & Waston, R.T. 1995. Global Biodiversity Assessment, Cambridge House, Delhi.
4. Joseph, K. & Nagendran, R. 2004. Essentials of Environmental Studies, Pearson Education (Singapore) Pte. Ltd., Delhi.
5. Kaushik, A. & Kaushik, C.P. 2004. Perspective in Environmental Studies, New Age International (P) Ltd, New Delhi.
6. Rajagopalan, R. 2011. Environmental Studies from Crisis to Cure. Oxford University Press, New Delhi.
7. Sharma, J. P., Sharma. N.K. & Yadav, N.S. 2005. Comprehensive Environmental Studies, Laxmi Publications, New Delhi.
8. Sharma, P. D. 2009. Ecology and Environment, Rastogi Publications, Meerut.
9. State of India's Environment 2018 by Centre for Sciences and Environment, New Delhi
10. Subramanian, V. 2002. A Text Book in Environmental Sciences, Narosa Publishing House, New Delhi.