

# SHIVAJI UNIVERSITY, KOLHAPUR



“A<sup>++</sup>” Accredited by NAAC(2021)

with CGPA 3.52

**Faculty of Interdisciplinary studies**

**Structure, Scheme and Syllabus for**

**Bachelor of Vocation (B. Voc.)**

**Nutrition and Dietetics.**

**Part I- Sem. I&II**

Subject to the modifications that will be made from  
time to time

Syllabus to be implemented from June, 2022-2023 onwards  
As per National Education Policy 2020

**SHIVAJI UNIVERSITY, KOLHAPUR**  
**STRUCTURE AND SYLLABUS OF B.VOC.**

**Bachelor of Vocation (B.Voc.) – Diploma Course: Nutrition and Dietetics.**

- TITLE** : B.Voc. (Nutrition and Dietetics)  
Syllabus ( Semester Pattern)  
Under Faculty of Interdisciplinary Studies
- YEAR OF IMPLEMENTATION:** Syllabus will be implemented from June, 2022-23
- DURATION** : B. Voc. Part I, II and III ( Three Years)  
B. Voc. Part I - Diploma ( One Year )  
B. Voc. Part II - Advanced Diploma ( Second Year)  
B. Voc. Part III – Degree ( Third Year)
- PATTERN OF EXAMINATION :** Semester Pattern
- **Theory Examination** - At the end of semester as per Shivaji University Rules
  - **Practical Examination** -
    - i) In the 1<sup>st</sup>, 3<sup>rd</sup> and 5<sup>th</sup> semester of B.Voc. there will be internal assessment of practical record, related report submission and project reports at the end of semester
    - ii) In the second semester of B. Voc. I, there will be internal practical examination at the end of semester
    - iii) In the 4<sup>th</sup> and 6<sup>th</sup> semester of B. Voc. there will be external practical examination at the end of semester
- MEDIUM OF INSTRUCTION** : English.
- STRUCTURE OF COURSE** : B. Voc. Part – I, II and III.  
Two Semester Per Year, Two General Papers per year / semester Three Vocational Papers per Year / Semester Three Practical papers per Year / Semester.
- SCHEME OF EXAMINATION :**
- A) THEORY-**
- The theory examination shall be at the end of the each semester.

- All the general theory papers shall carry 40marks and all vocational theory papers shall carry 50marks.
- Evaluation of the performance of the students in theory shall be on the basis of semester examination as mentioned above.
- Question paper will be set in the view of entire syllabus preferably covering each unit of the syllabus.
- **Nature of question paper for Theory examination** (Excluding Business Communication Paper)
  - i) There will be seven questions carrying equal marks.
  - ii) Students will have to solve any five questions

Que. No. 1 : Short answer type question with internal choice (Two out of Three)

Que. No. 2 to Que. No. 6: Long answer type questions.

Que. No. 7 : Short Notes with internal choice (Two out of Three)

#### **B) PRACTICALS:**

Evaluation of the performance of the students in practical shall be on the basis of semester examination ( Internal assessment at the end of Semester I, II and III and V and external examination at the end of Semester IV and VI as mentioned separately in each paper

#### **Standard of Passing:**

As per the guidelines and rules for B. Voc. (Attached Separately – Annexure I)

#### **Eligibility Criteria:**

1. The Eligibility for admission is 10+2 or equivalent, in any stream (Arts/Commerce/Science) from any recognized board or University.
2. The candidates after with 10+2 year ITI course in any branch/trade also eligible for course.
3. The candidates graduate from any faculty or engineering degree/diploma holders are also eligible.

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**Structure of the Course:**  
**B. Voc. –I (Diploma Course) Semester -I**

Sr. No .	Paper No.	Title	Theory/ Practical /Project	Marks (Total)	Distribution of Marks		Credits	
					Theory	Practical	Theory	Practical
1	101	Business Communication- I	Theory/ Practical	50	40	10	4	2
2	102	Fundamental of food science - I	Theory/ Practical	50	40	10	4	2
3	103	Human anatomy/ physiology - I	Theory	50	50	-	4	
4	104	Basic nutrition - I	Theory	50	50	-	4	-
5	105	Clinical nutrition/Diet therapy- I	Theory	50	50	-	4	-
6	106	Lab work – Human anatomy- I	Practical	50	-	50	-	4
7	107	Lab work – basic nutrition - I	Practical	50	-	50	-	4
8	108	Lab work – Clinical nutrition/Diet therapy- I	Practical	50	-	50	-	4
9	109	Project		50	-	50	-	-

**Structure of the Course:**  
**B. Voc. –I (Diploma Course) Semester -II**

Sr. No	Paper No.	Title	Theory/ Practical /Project	Marks (Total)	Distribution of Marks		Credits	
					Theory	Practical	Theory	Practical
1	201	Business Communication- II	Theory/ Practical	50	40	10	4	2
2	202	Fundamental of food science - II	Theory/ Practical	50	40	10	4	2
3	203	Human anatomy/ physiology - II	Theory	50	50	-	4	
4	204	Basic nutrition - II	Theory	50	50	-	4	-
5	205	Clinical nutrition/Diet therapy- II	Theory	50	50	-	4	-
6	206	Lab work – Human anatomy- II	Practical	50	-	50	-	4
7	207	Lab work – basic nutrition - II	Practical	50	-	50	-	4
8	208	Lab work – Clinical nutrition/Diet therapy- II	Practical	50	-	50	-	4
9	209	Project		50	-	50	-	-

**Scheme of Teaching: B. Voc. (Diploma Course) – Part I - Semester – I**

Sr. No.	Paper No.	Title	Distribution of workload (Per Week)		
			Theory	Practical	Total
1	101	Business Communication- I	4	2	6
2	102	Fundamental of food science- I	4	2	6
3	103	Human anatomy/physiology- I	4	-	4
4	104	Basic nutrition- I	4	-	4
5	105	Clinical nutrition/Diet therapy - I	4	-	4
6	106	Lab work – Human anatomy- I	-	4	4
7	107	Lab work – basic nutrition - I	-	4	4
8	108	Lab work – Clinical nutrition/ Diet therapy - I	-	4	4
9	109	Project	-	-	-
			20	16	36

**B. Voc. - Part-I - Semester – II**

Sr. No.	Paper No.	Title	Distribution of workload (Per Week)		
			Theory	Practical	Total
1	201	Business Communication- II	4	2	6
2	202	Fundamental of food science-II	4	2	6
3	203	Human anatomy /physiology-II	4	-	4
4	204	Basic nutrition-II	4	-	4
5	205	Clinical nutrition/Diet therapy - II	4	-	4
6	206	Lab work – Human anatomy - II	-	4	4
7	207	Lab work – basic nutrition II	-	4	4
8	208	Lab work – Clinical nutrition/ Diet therapy - II	-	4	4
9	209	Project	-	-	-
			20	16	36

**Structure of Course**

**B.Voc. - II (Advanced Diploma) Sem. III**

Sr. no	Paper no.	Title	Theory/practical/project	Marks	Distribution of Marks		Distribution of Workload (per Week)		
					Theory	practical	Theory	Practical	Total
<b>General Education Component</b>									
1.	301	Fundamentals of Financial Accounting-II	Theory/practical	50	40	10	4	2	6
2.	302	Computer Fundamentals	Theory/practical	50	40	10	4	2	6
<b>Skill Component</b>									
3.	303	Nutritional Biochemistry-III	Theory	50	50	-	4	-	4
4.	304	Medical Nutrition Therapy-III	Theory	50	50	-	4	-	4
5.	305	Human devolvement/ Public health nutrition-III	Theory	50	50	-	4	-	4
6.	306	Lab work- Nutritional Biochemistry-III	practical	50	-	50	-	4	4
7.	307	Lab work - Medical Nutrition Therapy-III	practical	50	-	50	-	4	4
8.	308	Lab work - Human devolvement/ Public health nutrition-III	practical	50	-	50	-	4	4
9.	309	Health Survey		50	-	50	-	-	-

**Structure of Course**

**B.Voc. - II (Advanced Diploma) Sem. IV**

Sr. no	Paper no.	Title	Theory/practical/project	Marks	Distribution of Marks		Distribution of Workload (per Week)		
					Theory	practical	Theory	Practical	Total
<b>General Education Component</b>									
1.	401	Fundamentals of Financial Accounting - II	Theory/practical	50	40	10	4	2	6
2.	402	Soft Skill and Personality Development	Theory/practical	50	40	10	4	2	6
<b>Skill Component</b>									
3.	403	Nutritional Biochemistry-IV	Theory	50	50	-	4	-	4
4.	404	Medical Nutrition Therapy-IV	Theory	50	50	-	4	-	4
5.	405	Human devolvement/ Public health nutrition-IV	Theory	50	50	-	4	-	4
6.	406	Lab work- Nutritional Biochemistry-IV	practical	50	-	50	-	4	4
7.	407	Lab work - Medical Nutrition Therapy-IV	practical	50	-	50	-	4	4
8.	408	Lab work - Human devolvement/ Public health nutrition-IV	practical	50	-	50	-	4	4
9.	409	Health Survey		50	-	50	-	-	-

**Scheme of Teaching : Advanced Diploma Part II (Advanced Diploma) Semester - III**

Sr. no	Paper no.	Title	Distribution of Workload (per Week)		
			Theory	Practical	Total
1.	301	Fundamentals of Financial Accounting-II	4	2	6
2.	302	Computer Fundamentals	4	2	6
3.	303	Nutritional Biochemistry-III	4	-	4
4.	304	Medical Nutrition Therapy-III	4	-	4
5.	305	Human devolvement/ Public health nutrition-III	4	-	4
6.	306	Lab work- Nutritional Biochemistry-III	-	4	4
7.	307	Lab work - Medical Nutrition Therapy-III	-	4	4
8.	308	Lab work - Human devolvement/ Public health nutrition-III	-	4	4
9.	309	Health Survey	-	-	-
		<b>Total</b>	<b>20</b>	<b>16</b>	<b>36</b>

**Scheme of Teaching : Advanced Diploma Part II (Advanced Diploma) Semester - IV**

Sr. no	Paper no.	Title	Distribution of Workload (per Week)		
			Theory	Practical	Total
1.	401	Fundamentals of Financial Accounting - II	4	2	6
2.	402	Soft Skill and Personality Development	4	2	6
3.	403	Nutritional Biochemistry-IV	4	-	4
4.	404	Medical Nutrition Therapy-IV	4	-	4
5.	405	Human devolvement/ Public health nutrition-IV	4	-	4
6.	406	Lab work- Nutritional Biochemistry-IV	-	4	4
7.	407	Lab work - Medical Nutrition Therapy-IV	-	4	4
8.	408	Lab work - Human devolvement/ Public health nutrition-IV	-	4	4
9.	409	Health Survey	-	-	-
		<b>Total</b>	<b>20</b>	<b>16</b>	<b>36</b>



**Structure of Course****B.Voc. - III (Degree) Sem. V**

Sr. no	Paper no.	Title	Theory/practical/ project	Marks	Distribution of Marks		Distribution of Workload (per Week)		
					Theory	practical	Theory	Practical	Total
1.	501	Nutritional Epidemiology	Theory/practical	50	40	10	4	2	6
2.	502	Research Methodology	Theory/practical	50	40	10	4	2	6
3.	503	Sport Nutrition (Psychology & Counseling)	Theory	50	50	-	4	-	4
4.	504	Clinical Testing / Food Analysis	Theory	50	50	-	4	-	4
5.	505	Food Quality Control	Theory	50	50	-	4	-	4
6.	506	Lab work- Sport Nutrition (Psychology & Counseling)	practical	50	-	50	-	4	4
7.	507	Lab work - Clinical Testing / Food Analysis	practical	50	-	50	-	4	4
8.	508	Lab work - Food Quality Control	practical	50	-	50	-	4	4
9.	509	Health Survey		50	-	50	-	-	-

**Structure of Course****B.Voc. - III (Degree) Sem. VI**

Sr. no	Paper no.	Title	Theory/practical/ project	Marks	Distribution of Marks		Distribution of Workload (per Week)		
					Theory	practical	Theory	Practical	Total
1.	601	Nutritional Epidemiology	Theory/practical	50	40	10	4	2	6
2.	602	Business Management	Theory/practical	50	40	10	4	2	6
3.	603	Sport Nutrition (Psychology & Counseling)	Theory	50	50	-	4	-	4
4.	604	Clinical Testing / Food Analysis	Theory	50	50	-	4	-	4
5.	605	Food Quality Control	Theory	50	50	-	4	-	4
6.	606	Lab work- Sport Nutrition (Psychology & Counseling)	practical	50	-	50	-	4	4
7.	607	Lab work - Clinical Testing / Food Analysis	practical	50	-	50	-	4	4
8.	608	Lab work - Food Quality Control	practical	50	-	50	-	4	4
9.	609	Health Survey		50	-	50	-	-	-

**Scheme of Teaching : Degree Part III (Degree) Semester - V**

Sr. no	Paper no.	Title	Distribution of Workload (per Week)		
			Theory	Practical	Total
1.	501	Nutritional Epidemiology	4	2	6
2.	502	Research Methodology	4	2	6
3.	503	Sport Nutrition (Psychology & Counseling)	4	-	4
4.	504	Clinical Testing / Food Analysis	4	-	4
5.	505	Food Quality Control	4	-	4
6.	506	Lab work- Sport Nutrition (Psychology & Counseling)	-	4	4
7.	507	Lab work - Clinical Testing / Food Analysis	-	4	4
8.	508	Lab work - Food Quality Control	-	4	4
9.	509	Health Survey	-	-	-
<b>Total</b>			<b>20</b>	<b>16</b>	<b>36</b>

**Scheme of Teaching : Degree Part III (Degree) Semester - VI**

Sr. no	Paper no.	Title	Distribution of Workload (per Week)		
			Theory	Practical	Total
1.	601	Nutritional Epidemiology	4	2	6
2.	602	Research Methodology	4	2	6
3.	603	Sport Nutrition (Psychology & Counseling)	4	-	4
4.	604	Clinical Testing / Food Analysis	4	-	4
5.	605	Food Quality Control	4	-	4
6.	606	Lab work- Sport Nutrition (Psychology & Counseling)	-	4	4
7.	607	Lab work - Clinical Testing / Food Analysis	-	4	4
8.	608	Lab work - Food Quality Control	-	4	4
9.	609	Health Survey	-	-	-
<b>Total</b>			<b>20</b>	<b>16</b>	<b>36</b>

**Eligibility for Admission**

10 + 2 from any faculty or equivalent Diploma /Advanced Diploma in any related stream

Students who have completed certificate course in nutrition and dietetics are eligible for the second year admission to the course of nutrition and dietetics

**Eligibility for Faculty**

Faculty- Staff qualification-

1.M.Sc Nutrition /M.A. Home Science

2. Diploma in Nutrition and Dietetics

3.M.B.B.S/B

A.MS/B.H.M.Swith NET / SET/Ph.D.

M. A (English) with NET/SET for Business Communication

**Eligibility for Laboratory Assistant:**

B.Sc. (nutrition and dietetics) Diploma in Nutrition and Dietetics

**Staffing Pattern**

: In 1<sup>st</sup> Year of B. Voc. - 1 Full Time and 1 Part Time Lecturer and 1 CHB Lecturer for Business Communication

**Laboratory Assistant**

: For 1<sup>st</sup> Year of B. Voc. - 1 Part-time

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## **CREDIT SYSTEM**

### **FOR B. Voc. – Nutrition and Dietetics**

#### **Credit system:**

Education at the Institute is organized around the semester-based credit system of study. The type of credit will be credit by theory and practical examination. The prominent features of the credit system are a process of continuous evaluation of a student's performance/progress and flexibility to allow a student to progress at an optimum pace suited to his/her ability or convenience, subject to fulfilling minimum requirements for continuation. A student's performance/progress is measured by the number of credits that he/she has earned, i.e. completed satisfactorily. Based on the course credits and grades obtained by the student, grade point average is calculated. A minimum grade point average is required to be maintained for satisfactory progress and continuation in the programme. Also a minimum number of earned credits and a minimum grade point average should be acquired in order to qualify for the degree.

All programmes are defined by the total credit requirement and a pattern of credit distribution over courses of different categories.

#### **Course credits assignment:**

Each course has a certain number of credits assigned to it depending upon its lectures and laboratory contact hours in a week. This weight age is also indicative of the academic expectation that includes in-class contact and self-study outside of class hours.

- a. One credit would mean equivalent to 15 periods for lectures, practical's/workshop.
- b. For internship/ field work, the credit weight age for equivalent hours shall be equal of that for lecture / practical.

The credits for each of the year of B. Voc. Course will be as follows:

<b>Level</b>	<b>Awards</b>	<b>Normal calendar duration</b>	<b>Skill Component Credits</b>	<b>General Education Credits</b>
Year 1	Diploma	Two Semesters	36	24
Year 2	Advanced Diploma	Four Semesters	36	24
Year 3	B. Voc.	Six Semesters	36	24
<b>Total</b>			108	72

**Subject wise credit assignment for B. Voc. – Part II (Diploma) Semester – I**

Sr No	Paper No.	Title	Theory/ Practical/ Project	Marks (Total)	Distribution of Marks		Credits	
					Theory	Practical	Theory	Practical
1	101	Business Communication- I	Theory /Practical	50	40	10	3	2
2	102	Fundamental of food science- I	Theory /Practical	50	40	10	3	2
3	103	Human anatomy/physiology- I	Theory	50	50	--	3	--
4	104	Basic nutrition- I	Theory	50	50	--	3	--
5	105	Clinical nutrition/Diet therapy - I	Theory	50	50	--	3	--
6	106	Lab work – Human anatomy- I	Practical	50	--	50	--	3
7	107	Lab work – basic nutrition - I	Practical	50	--	50	--	3
8	108	Lab work – Clinical nutrition/ Diet therapy - I	Practical	50	--	50	--	3
9	109	Project	--	50	--	50	--	2

**Subject wise credit assignment for B. Voc. – Part I (Diploma) Semester – II**

Sr No	Paper No.	Title	Theory/ Practical/ Project	Marks (Total)	Distribution of Marks		Credits	
					Theory	Practical	Theory	Practical
1	201	Business Communication- II	Theory /Practical	50	40	10	3	2
2	202	Fundamental of food science-II	Theory /Practical	50	40	10	3	2
3	203	Human anatomy /physiology-II	Theory	50	50	--	3	--
4	204	Basic nutrition-II	Theory	50	50	--	3	--
5	205	Clinical nutrition/Diet therapy - II	Theory	50	50	--	3	--
6	206	Lab work – Human anatomy - II	Practical	50	--	50	--	3
7	207	Lab work – basic nutrition II	Practical	50	--	50	--	3
8	208	Lab work – Clinical nutrition/ Diet therapy - II	Practical	50	--	50	--	3
9	209	Project	--	50	--	50	--	2

*\*For Project/Industrial visit /study tour /internship, the workload includes self-study outside of class hours i.e.4 lectures per week.*

## Evaluation system:

### 1. Standard of passing

The maximum credits for B. Voc. Hotel Management and Catering Technology semester course (of six semesters) will be  $30 \times 6 = 180$  credits.

To pass in each paper students are required to obtain 4 grade points in each paper, it means 18 to 20 Marks for 50 Marks Theory / Practical papers, 14.08 to 16 for 40 Marks Theory papers and 04 marks for 10 Marks Practical papers.

### 2. Assessment of Project / Industrial visit /study tour /Internship Report

- i) The Project/Industrial visit/study tour/Internship report must be submitted by the prescribed date usually two weeks before the end of academic session of the semester.
- ii) It is desirable that the topics for Project/Industrial visit/study tour/Internship report shall be assigned by the end of previous semester.
- iii) The Project/Industrial visit/study tour/Internship report and its presentation shall be evaluated by the coordinator of the course and concerned faculty.

### 3. Grade point for Theory/Practical/ Project / Industrial visit /study tour /Internship Report

- Table –I: for 50 Marks Theory or Practical

Grade Point	Marks out of	Marks obtained	Grade	Description of performance
0	50	0.0 to 2.5	D	Unsatisfactory
1	50	2.6 to 5.0		
1.5	50	5.1 to 7.5		
2	50	7.6 to 10.0		
2.5	50	10.1 to 12.5		
3	50	12.6 to 15.0		
3.5	50	15.1 to 17.5		
4	50	17.6 to 20.0	C	Fair
4.5	50	20.1 to 22.5		
5	50	22.6 to 25.0	B	Satisfactory
5.5	50	25.1 to 27.5		
6	50	27.6 to 30.0	B+	Good
6.5	50	30.1 to 32.5		
7	50	32.6 to 35.0	A	Very Good
7.5	50	35.1 to 37.5		
8	50	37.6 to 40.0	A+	Excellent
8.5	50	40.1 to 42.5		
9	50	42.6 to 45.0	O	Outstanding
9.5	50	45.1 to 47.5		
10	50	47.6 to 50.0		

• **Table No-II: for 40 Marks Theory and for 10 Marks Practical**

Grade Point	Marks out of	Marks obtained	Grade	Description of performance
0.00	40	0.0 to 2.0	D	Unsatisfactory
1	40	2.08 to 4.0		
1.5	40	4.08 to 6.0		
2	40	6.08 to 8.0		
2.5	40	8.08 to 10.0		
3	40	10.08 to 12.0		
3.5	40	12.08 to 14.0		
4	40	14.08 to 16.0	C	Fair
4.5	40	16.08 to 18.0	B	Satisfactory
5	40	18.08 to 20.0		
5.5	40	20.08 to 22.0	B <sup>+</sup>	Good
6	40	22.08 to 24.0		
6.5	40	24.08 to 26.0	A	Very Good
7	40	26.08 to 28.0		
7.5	40	28.08 to 30.0	A <sup>+</sup>	Excellent
8	40	30.08 to 32.0		
8.5	40	32.08 to 34.0	O	Outstanding
9	40	34.08 to 36.0		
9.5	40	36.08 to 38.0		
10	40	38.08 to 40.0		
Grade Point	Marks out of	Marks obtained	Grade	Description of performance
0.00	10	0.0 to 0.5	D	Unsatisfactory
1	10	0.52 to 1.0		
1.5	10	1.02 to 1.5		
2	10	1.52 to 2.0		
2.5	10	2.02 to 2.5		
3	10	2.52 to 3.0		
3.5	10	3.02 to 3.5		
4	10	3.52 to 4.0	C	Fair
4.5	10	4.02 to 4.5	B <sup>+</sup>	Satisfactory
5	10	4.52 to 5.0		
5.5	10	5.02 to 5.5	B	Good
6	10	5.52 to 6.0		
6.5	10	6.02 to 6.5	A	Very Good
7	10	6.52 to 7.0		
7.5	10	7.02 to 7.5	A <sup>+</sup>	Excellent
8	10	7.52 to 8.0		
8.5	10	8.02 to 8.5	O	Outstanding
9	10	8.52 to 9.0		
9.5	10	9.02 to 9.5		
10	10	9.52 to 10.0		

### Calculation of SGPA and CGPA-

1. Semester Grade Point Average (SGPA) =  $\frac{\Sigma (\text{course credits in passed courses} \times \text{earned grade points})}{\Sigma (\text{Course credits in registered courses})}$

2. Cumulative Grade Point Average =  $\frac{\Sigma (\text{course credits in passed courses} \times \text{earned grade points}) \text{ of all Semesters}}{(\text{CGPA}) \quad \Sigma (\text{Course credits in registered courses}) \text{ of all Semesters}}$

3. At the end of each year of B. Voc. Program, student will be placed in any one of the divisions as detailed below:

### SGPA and CGPA Table

Grade Point	Grade	Description of performance
0.00 to 3.49	D	Unsatisfactory
3.5 to 4.49	C	Fair
4.5 to 5.49	B	Satisfactory
5.5 to 5.99	B	Good
6.0 to 6.99	A	Very Good
7.0 to 8.49	A <sup>+</sup>	Excellent
8.5 to 10.00	O	Outstanding

- I<sup>st</sup> Class with distinction: CGPA > 7.0 and above
- I<sup>st</sup> Class: CGPA > 6.0 and < 7.0
- II<sup>nd</sup> Class: CGPA > 5.0 and < 6.0
- Pass Class: CGPA > 4.0 and < 5.0
- Fail: CGPA < 4.0



**SHIVAJI UNIVERSITY, KOLHAPUR**

**Practical Syllabus**

**B. Voc. Part – III, Semester - V**

**Nutrition and Dietetics**

**Paper No – 501 - NUTRITION EPIDEMIOLOGY**

**THEORY-4**

**PRACTICAL-2**

**UNIT-1 DIET IN LIVER DISEASE AND COUNSELING**

- Hepatitis
- Hepatic Coma
- Cirrhosis Of Liver
- Disease Of Gall Bladder
- Disease Of Pancrease

**UNIT-2 DIET IN KIDNEY DISEASE AND COUNSELING**

- Glomerulonephritis
- Nephritic syndrome
- Acute renal failure
- Chronic renal failure
- End stage renal disorder
- Urolithiasis

**UNIT-3 NUTRITION IN EATING DISORDER AND COUNSELING**

- Introduction
- Annorexia nervosa
- Bulima nervosa
- Binge eating Disorder

**UNIT-4 NUTRITION AND NEUROLOGICAL DISORDER AND COUNCELLING**

- Parkinson disease
- Alzheimer disease
- Epilepsy
- Migrate
- Multiple stenosis
- Neuro trauma
- Spine trauma
- Feeding problem of patient with neurological disorder

**Practicals:-**

1. To Plan a Diet for Hepatitis.
2. To Plan a Diet for Nephritic syndrome
3. To Plan a Diet for Anorexia
4. To Plan a Diet for Neurological disorder

## Reference:-

1. Hunter, Dj, Spiegelman, D, Adami, H-O, Beeson, L, Van den Brandt, PA, Folsom, AR, et al. Cohort studies of fat intake and the risk of breast cancer – a pooled analysis. *N. Engl. J. Med.* 1996; 334: 356–61.[CrossRefGoogle ScholarPubMed](#)
2. Fuchs, CS, Giovannucci, EL, Colditz, GA, Hunter, DJ, Stampfer, MJ, Rosner, B, et al. Dietary fiber and the risk of colorectal cancer and adenoma in women. *N. Engl. J. Med.* 1999; 340: 169–76.[CrossRefGoogle ScholarPubMed](#)
3. Michels, KB, Giovannucci, E, Joshipura, KJ, Rosner, BA, Stampfer, MJ, Fuchs, CS, et al. Prospective study of fruit and vegetable consumption and incidence of colon and rectal cancers. *J. Natl. Cancer Inst.* 2000; 92: 1740–52.[CrossRefGoogle ScholarPubMed](#)
4. Beaton, GH, Milner, J, Corey, P, McGuire, V, Cousins, M, Stewart, E, et al. Sources of variance in 24-hour dietary recall data: implications for nutrition study design and interpretation. *Am. J. Clin. Nutr.* 1979; 32: 2546–9.[CrossRefGoogle ScholarPubMed](#)
5. Freudenheim, JL, Marshall, JR. The problem of profound mismeasurement and the power of epidemiological studies of diet and cancer. *Nutr. Cancer.* 1988; 11: 243–50.[CrossRefGoogle ScholarPubMed](#)
6. Freedman, LS, Schatzkin, A, Wax, J. The impact of dietary measurement error on planning sample size required in a cohort study. *Am. J. Epidemiol.* 1990; 132: 1185–95.[CrossRefGoogle Scholar](#)

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**Practical Syllabus**  
**B. Voc. Part – III, Semester - V**  
**Nutrition and Dietetics**  
**Paper No – 502 - RESEARCH METHODOLOGY**

Theory-4

Practical-2

**Objectives:**

1. To build in students appreciation for high quality research.
2. To introduce students to the skills needed in conducting a research.

**Unit I A. An introduction to research methodology:**

Definition Objectives of research Types of research- Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. qualitative, Conceptual vs. Empirical Other types: Cross sectional vs. longitudinal, Field setting or laboratory, clinical or diagnostic, Exploratory, Historical research.

Research approach: Quantitative and qualitative approach Ethics in research, applying for ethical approval/ clearance Defining the research problem: Selecting and defining the problem Literature survey Formulation of hypothesis B. Research designs: Need for a research design, features of a good design Types of research designs- Explorative/ descriptive/ experimental/ Survey/ Case Study<sup>15</sup>

**Unit II A. Sampling techniques for nutrition research Sample design-Criteria of selecting a sampling procedure;** Characteristics of a good sampling design Types of sample designs: Non- probability sampling and Probability sampling Purposive sampling, Simple random sampling, Systematic sampling, Stratified sampling, Quota sampling, Cluster sampling, Multi-stage sampling, Sequential sampling. Determination of sample size for different type of research B. Measurement and scaling techniques Measurement scales: Nominal, Ordinal Interval, Ratio Validity, Reliability and Practicality Scaling, scaling techniques - rating scales (paired comparison, rank order), likert scales etc. 15

**Unit III A. Methods/ tools of data collection Collection of primary data:**

Observation method, Interview method, Questionnaire method, case study method. Collection of secondary data Selection of appropriate method of data collection B. Data processing and management Processing operations: Editing, coding, classification, tabulation Use of data entry software.

**Practical Works:-**

- 1) To do Research Methodology Cases at least 5
- 2) Survey Report

**References**

- Bhattacharyya, G.K. & Johnson, R. A. (1977). Statistical concepts and methods. NY: John Wiley. Dwivedi, R. S. (1997). Research methods in behavioral sciences. Delhi: Macmillan India. Gravetter, F.
- J. & Waillnau, L. B. (2000). Statistics for the behavioral sciences. Belmont, CA: Wadsworth/Thomson Learning. Kerlinger, F. N. & Lee, H. B. (2000). Foundations of behavioral research. Orlando, Florida: Harcourt. Kothari, C.R. (2004). Research Methodology-Methods and Techniques. New Age International Publishers, New Delhi. Leong, F.T.L. & Austin, J. T. (Eds.) (1996). The psychology research handbook. New Delhi

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**Nutrition and Dietetics**  
**Paper No – 503 - Sport Nutrition (Psychological & Counseling)**

**Theory-4**

**Practical-4**

**UNIT-1 SPORT NUTRITION**

- Introduction

**UNIT-2 Evaluation and growth of sport nutrition**

- Importance of carbohydrate loading

**UNIT-3 Pregame and Post game Meals**

**UNIT -4 Approach to the management of illness and health**

- Nutrition, exercise, physical fitness and health their interrelationship.

**References: \_**

- Nutrition and Metabolism in Sports, Exercise and Health 2nd Edition by Jie Kang (Author)
- Bigger Leaner Stronger: The Simple Science of Building the Ultimate Male Body Paperback – March 15, 2019 by Michael Matthews
- The Plant-Based Boost: Nutrition Solutions for Athletes and Exercise Enthusiasts Paperback – May 27, 2019

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**B. Voc. Part – III, Semester - V**  
**Nutrition and Dietetics**  
**Paper No – 504 - Clinical Testing/Food Analysis**

**Theroy-4**

**Practical-4**

**Unit - I : Bioanalytical Chemistry & Enzymology**

- a) Standardization of acids and alkalies
- b) Preparation of buffers, indicators and use of pH meter
- c) Paper chromatography of amino acids and sugars
- d) Isolation, calculation of percent yield of amylase from sweet potato and study of optimum pH, Km
- e) Estimation of Acid Phosphatase

**Unit- II : Isolation, Preparation & Extraction**

- a) Casein from milk
- b) Cholesterol from egg yolk
- c) Lycopene from tomatoes
- d) Albumin & globulin from egg whites

**Unit - III : Clinical Analysis (from blood, serum) Estimation of:**

- a) Glucose by Folin- Wu Method, GOD/POD
- b) Lipid profile- Triglycerides & cholesterol
- c) Protein by Biuret, Fehn-Lowry
- d) Estimation of Iron
- e) Estimation of Calcium
- f) Estimation of phosphorus

**Unit - IV : OIL Extraction In Milk And Food seeds.**

Types, Method etc,

## References

- Bayens Dominiezak – Medical biochemistry, Mosby Publishers, Harcourt, 1999  
Brave Robert D – Introduction to Instrumental Analysis, McGraw Hill Book Co, New York  
Chatterjee and Rana Shinde Medical - Biochemistry Dandekar, S. P., Rane S. A. (2004).
- Practicals & Viva in Medical Biochemistry, New Delhi: Elsevier/Reed Elsevier  
Feitz – Clinical Chemistry Frelfelder D- Physical Biochemistry.
- Skoog Douglas A – Principles of Instrumental Analysis Harcourt Brace publishers, London  
Gill CV – Short cases in clinical biochemistry, Churchill Livingstone, Edinburgh, 1984  
Godkar, P. B. (2003).
- Textbook of Medical Laboratory Technology 2nd Ed. Mumbai. Bhalani Publishing House.  
Greenberg David M – Metabolic Pathways. Vols. 2 and 3, 3rd editions. Academic Press, New York  
Harvey David
- Modern Analytical Chemistry, International edition Henry Richard et al – Clinical Chemistry, Principles and Techniques, 2nd edition, Harper and Row, New York  
Holme David J – Problem solving in analytical biochemistry, H & Longman Sc. And Tech, Essex India Pvt Ltd. Jayaram J., (1981)
- Laboratory Manual in Biochemistry, New Delhi: Wiley Eastern Ltd. John Bernard Henry, Clinical Diagnosis and Management by Laboratory Methods, Saunders publications, 20th edition  
Kamal SH – Clinical Biochemistry for Medical Technologies, Churchill Livingstone, London  
Methods in Enzymology
- Kaplan Murray Robert – Harper's biochemistry, 24th edition, Prentice Hall International UK LTD, 1990  
Nelson DI, Cox MM – Lehninger Principles of Biochemistry Nina Alexander J and Ballou David P
- Fundamental Laboratory Approaches for Biochemistry and Biotechnology, Fitzgerald Science Press, Bethesda on, McGraw, Hill, Boston  
Pearson, D. (1970). Chemical Analysis of Foods, (6th Ed), London:
- T.A. Churchill. Plummer, D. T. (1979). Introduction to Practical Biochemistry. Bombay: Tata McGraw Hill Pub. Co. Ltd. Practical Biochemistry by David Plummer Rao Ranganathan – Text book of biochemistry 3rd edition, Prentice Hall, New Delhi  
Rodney

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**Practical Syllabus**  
**B. Voc. Part – III, Semester - V**  
**Nutrition and Dietetics**  
**Paper No – 505 - Food Quality Control**

**Theroy-4**

**Practical-4**

<b>S. No</b>	<b>Topic</b>	<b>Domain</b>
<b>UNIT 1</b>	<b>Concept meaning and exposure, estimation, toxicological requirements and risk assessment</b>  Food quality, food safety, food adulteration, food hazards. Natural toxins.	<b>Must Know</b> Definition of food quality, food safety Functions of food <b>Desirable to know</b> Concept of food safety Responsibility for food quality and safety Types of adulteration <b>Nice to know</b> Scope of food safety and quality
<b>UNIT 2</b>	<b>Food laws and regulations</b>  National and international food laws Governing bodies.	<b>Must Know</b> Introduction to food laws National and International foodlaws Governing bodies <b>Desirable to know</b> Importance of food laws Laws related to food safety
<b>UNIT 3</b>	<b>Safety aspects</b>  Water and beverages such as soft drinks, tea, coffee, cocoa.	<b>Must Know</b> Introduction to safety aspects Classification of safety aspects Safety aspects for water and beverages
<b>UNIT 4</b>	<b>Safety assessment and Safety evaluation</b>  Food contaminants and pesticide residues. heat treatments and related processing techniques	<b>Must Know</b> Introduction to safety assessment and safety evaluation Definition of safety assessment Definition of safety evaluation Introduction to food contaminants Types of food contaminants
		<b>Desirable to know</b> Methods of preventing food contaminants Laws & regulations



## Reference Books:-

1. Hubbard, M.R., *Statistical Quality Control for the Food Industry*, Kluwer Academic/Plenum Publishers, New York, 2003. Ong, K.G., Puckett, L.G., Sharma, B.V., Loiselle, M., Grimes, C.A., Bachas, L.G., *Wireless, Passive, Resonant-Circuit Sensors for Monitoring Food Quality*, Proceedings of SPIE, Vol. 4575, 2002, pp. 150–159.
2. Thorner, M.E., Manning, P.B., *Quality Control in Food Service*, The AVIPublishing Company, Westport, Connecticut, 1976.
3. Vasconcellos, J.A., *Quality Assurance for the Food Industry*, CRC Press, BocaRaton, Florida, 2004
4. Mears, P., *Quality Improvement Tools and Techniques*, McGraw Hill BookCompany, New York, 1995.
5. Kanji, G.K., Asher, M., *100 Methods for Total Quality Management*, SagePublications Ltd., London, 1996.
6. Dhillon, B.S., *Advanced Design Concepts for Engineers*, Technomic PublishingCompany, Lancaster, Pennsylvania, 1998.
7. Dhillon, B.S., *Reliability, Quality, and Safety for Engineers*, CRC Press, BocaRaton, Florida, 2005.
8. Pyzdek, T., *The Six Sigma Handbook*, McGraw Hill Book Company, NewYork, 2003.
9. Mizuno, S., Editor, *Management of Quality Improvement: The Seven New QCTools*, Productivity Press, Cambridge, Massachusetts, 1988.

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**Practical Syllabus**

**B. Voc. Part – III, Semester - V**

**Nutrition and Dietetics**

**Paper 506 : Lab Work - Sport Nutrition (Psychological & Counseling)**

Total Workload: 06

Total Marks - 50

Practical - 4 Lectures / Week / Batch of 20 Students

**Each one 2 practical's**

1. Visit to Gym
2. Five types of gym diet plan
3. Case studies of gymnastic persons
4. Counselling and exercise assignments.

**Scheme of Practical Evaluation**

**50 Marks**

**Internal Practical Evaluation**

- |   |          |
|---|----------|
| 1) Prepare any one practical from the above | 20 Marks |
| 2) Practical record book                    | 20 Marks |
| 3) Viva - Voce                              | 10 Marks |

**References: \_**

- Nutrition and Metabolism in Sports, Exercise and Health 2nd Edition by Jie Kang (Author)
- Bigger Leaner Stronger: The Simple Science of Building the Ultimate Male Body Paperback – March 15, 2019 by Michael Matthews
- The Plant-Based Boost: Nutrition Solutions for Athletes and Exercise Enthusiasts Paperback – May 27, 2019

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**Nutrition and Dietetics**  
**Paper 507 : Lab Work - Clinical Testing/Food Analysis**

Total Workload: 06

Total Marks - 50

Practical - 4 Lectures / Week / Batch of 20 Students

**Each one 2 practical's**

1. Estimation of Specific Gravity of Milk
2. Estimation Of Gluten in Wheat flour.
3. Estimation of Blood Sugar
4. Estimation of Blood Presures.

**Scheme of Practical Evaluation**

**50 Marks**

**Internal Practical Evaluation**

- |   |          |
|---|----------|
| 1) Prepare any one practical from the above | 20 Marks |
| 2) Practical record book                    | 20 Marks |
| 3) Viva - Voce                              | 10 Marks |

**References: \_**

- Bayens Dominiezak – Medical biochemistry, Mosby Publishers, Harcourt, 1999 Brave Robert D – Introduction to Instrumental Analysis, McGraw Hill Book Co, New York Chatterjee and Rana Shinde Medical - Biochemistry Dandekar, S. P., Rane S. A. (2004).
- Practicals & Viva in Medical Biochemistry, New Delhi: Elsevier/Reed Elsevier Feitz – Clinical Chemistry Frelfelder D- Physical Biochemistry.
- Skoog Douglas A – Principles of Instrumental Analysis Harcourt Brace publishers, London Gill CV – Short cases in clinical biochemistry, Churchill Livingstone, Edinburgh, 1984 Godkar, P. B. (2003).
- Textbook of Medical Laboratory Technology 2nd Ed. Mumbai. Bhalani Publishing House. Greenberg David M – Metabolic Pathways. Vols. 2 and 3, 3rd editions. Academic Press, New York Harvey David
- Modern Analytical Chemistry, International editi Henry Richard et al – Clinical Chemistry, Principles and Techniques, 2nd edition, Harper and Row, New York Holme David J – Problem solving in analytical biochemistry, H & Longman Sc. And Tech, Essex India Pvt Ltd. Jayaram J., (1981)

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**B. Voc. Part – III, Semester - V**  
**Nutrition and Dietetics**  
**Paper 508 : Lab Work - Food Quality Control**

Total Workload: 06  
Practical - 4 Lectures / Week / Batch of 20 Students

Total Marks - 50

**Each one 2 practical's**

1. Sensory Evaluation Of Foods
2. Shelf life of Food Products.
3. Industry Visit in Laboratory Testing.
4. Food Quality Standards
5. GMP

**Scheme of Practical Evaluation**

**50 Marks**

**Internal Practical Evaluation**

- |   |          |
|---|----------|
| 1) Prepare any one practical from the above | 20 Marks |
| 2) Practical record book                    | 20 Marks |
| 3) Viva - Voce                              | 10 Marks |

**Reference Books:-**

1. Hubbard, M.R., *Statistical Quality Control for the Food Industry*, Kluwer Academic/Plenum Publishers, New York, 2003. Ong, K.G., Puckett, L.G., Sharma, B.V., Loiselle, M., Grimes, C.A., Bachas, L.G., *Wireless, Passive, Resonant-Circuit Sensors for Monitoring Food Quality*, Proceedings of SPIE, Vol. 4575, 2002, pp. 150–159.
2. Thorner, M.E., Manning, P.B., *Quality Control in Food Service*, The AVIPublishing Company, Westport, Connecticut, 1976.
3. Vasconcellos, J.A., *Quality Assurance for the Food Industry*, CRC Press, BocaRaton, Florida, 2004
4. Mears, P., *Quality Improvement Tools and Techniques*, McGraw Hill BookCompany, New York, 1995.
5. Kanji, G.K., Asher, M., *100 Methods for Total Quality Management*, SagePublications Ltd., London, 1996.
6. Dhillon, B.S., *Advanced Design Concepts for Engineers*, Technomic PublishingCompany, Lancaster, Pennsylvania, 1998.
7. Dhillon, B.S., *Reliability, Quality, and Safety for Engineers*, CRC Press, BocaRaton, Florida, 2005.

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**Practical Syllabus**

**B. Voc. Part – III, Semester - V**

**Nutrition and Dietetics**

**Paper – 509 : Lab Work - Health Survey**

Total Workload: 06

Total Marks - 50

Practical - 4 Lectures / Week / Batch of 20 Students

**Scheme of Practical Evaluation**

**50 Marks**

**SHIVAJI UNIVERSITY, KOLHAPUR**  
**Practical Syllabus**  
**B. Voc. Part – III, Semester - VI**  
**Nutrition and Dietetics**  
**Paper No – 601 - NUTRITION EPIDEMIOLOGY**

**THEORY-4**

**PRACTICAL-2**

**UNIT-1 DISEASE OF METABOLIC DISORDER AND COUNSELING**

- Diabetese Melitus
- Gout

**UNIT-2 DIET IN CARDIOVASCULAR DISEASE AND COUNSELING**

- Coronary Heart Disease
- Prevalence
- Risk factor
- Pathophysiology
- Dyslipidaemia
- Atherosclerosis
- Hypertention
- Hyoitension
- Angina pectoris
- Myocardial infection
- Congestinal cardiac failure

**UNIT-3 DIET IN CANCER AND COUNSELING**

- Risk factor
- Metabolic alteration and nutritional problem related cancer
- Nutritional requirements of cancer patient related to cancer therapy
- Cancer prevention

**UNIT-4 DIET IN GASTROINTESTINAL AND COUNSELING**

- Upper GI tract disorder
- Lower GI tract disorder
- Constipation diarrhoea, intestinal gas and flatulence
- Disease of small intestine
- Disease of large intestine

**Practical:-**

1. To plan a diet for IDDM.
2. To plan a diet for hypertension.
3. To plan a diet for cancer.
4. To plan a diet for GT tract

**Reference:-**

1. Hunter, Dj, Spiegelman, D, Adami, H-O, Beeson, L, Van den Brandt, PA, Folsom, AR, et al. Cohort studies of fat intake and the risk of breast cancer – a pooled analysis. N. Engl. J. Med. 1996; 334: 356–61.[CrossRefGoogle ScholarPubMed](#)
2. Fuchs, CS, Giovannucci, EL, Colditz, GA, Hunter, DJ, Stampfer, MJ, Rosner, B, et al. Dietary fiber and the risk of colorectal cancer and adenoma in women. N. Engl. J. Med. 1999; 340: 169–76.[CrossRefGoogle ScholarPubMed](#)
3. Michels, KB, Giovannucci, E, Joshipura, KJ, Rosner, BA, Stampfer, MJ, Fuchs, CS, et al. Prospective study of fruit and vegetable consumption and incidence of colon and rectal cancers. J. Natl. Cancer Inst. 2000; 92: 1740–52.[CrossRefGoogle ScholarPubMed](#)
4. Beaton, GH, Milner, J, Corey, P, McGuire, V, Cousins, M, Stewart, E, et al. Sources of variance in 24-hour dietary recall data: implications for nutrition study design and interpretation. Am. J. Clin. Nutr. 1979; 32: 2546–9.[CrossRefGoogle ScholarPubMed](#)
5. Freudenheim, JL, Marshall, JR. The problem of profound mismeasurement and the power of epidemiological studies of diet and cancer. Nutr. Cancer. 1988; 11: 243–50.[CrossRefGoogle ScholarPubMed](#)
6. Freedman, LS, Schatzkin, A, Wax, J. The impact of dietary measurement error on planning sample size required in a cohort study. Am. J. Epidemiol. 1990; 132: 1185–95.[CrossRefGoogle Scholar](#)

**SHIVAJI UNIVERSITY, KOLHAPUR**  
**B. Voc. Part – III, Semester - VI**  
**Nutrition and Dietetics**  
**Paper – 602 : Business Management**  
**Total Workload: 06 lectures per week of 60 min.**

**Distribution of Workload:**

Theory	:	04 lectures per week
Practical	:	02 lectures per week per batch of 20students

Marks : 40

**Unit 1: An Introduction to Management:**

- Meaning and Definition of Management, The Environment of organizations and Managers: Social, Technological, Economic, Ethical, Political& Legal.

**Understanding the Manager's Job**

- Goal setting and Planning, MBO: Management ay Objectives, Importance of business planning, Steps in planning, Types of Plans Planning and Strategic Management: TOWS Matrix. Decision Making: Bases of selection under alternative courses of action

**Unit 2: Organizing & Staffing**

- Organization: Formal and Informal Organizations
- Departmentation
- Managing Human Resources: Concept of Authority, responsibility, Line and staff relation.
- Meaning of Staffing, Recruiting, Selecting and training

**Unit 3: Motivation**

- Meaning of Motivation, Maslow's Hierarchy of needs, Herzberg' Two Factor theory, McGregor's Theory X and Theory Y, Theory Z by Ouchi, Managing Individual Behaviour, Motivating Employee Performance.

**Directing and Communication**

- Managing Individual Behaviour, Centralization and Decentralization, Leadership and Influence Processes , Communication in Organizations Managing Groups and Teams

**Unit 4: Controlling**

- Managing the Control Process
- Managing Groups and Teams
- Managing Operations, Quality, and Productivity

**Practical : Based on the theory units:**



**Reference Books:**

- Peter F. Drucker Practice of Management -Pen Books Ltd.
- Sherlekar&Sherlekar Principles of Business Management, Himalaya Publishing House.
- James Stoner, Freeman, Gilbert Management, Pearson Education.
- Srinivasan &Chunawala Management of principles& practice Himalaya Publishing House.
- Burton, Thakur Management Today, Principles
- Stephen Robbins Organisational Behaviour
- Stephen Robbins, Mary Coulter Management
- Fred Luthans Organisational Behaviour

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**B. Voc. Part – III, Semester - VI**  
**Nutrition and Dietetics**  
**Paper No – 603 - Sport Nutrition (Psychological & Counseling)**

**Theory-4**

**Practical-4**

**UNIT-1 SPORT NUTRITION**

- Parameter of Fitness and Tests

**UNIT-2 SIGNIFICANCE OF PHYSICAL FITNESS**

- Nutrition in Prevention and management of weight control region.

**UNIT-3 NUTRITION GUIDELINE FOR MAINTAINANCE OF HEALTH AND FITNESS.**

**UNIT -4 NUTRITION AND REQUIREMENT OF EXERCISE**

- Dietary Supplements & Ergogenic Aids.

**References: \_**

- Nutrition and Metabolism in Sports, Exercise and Health 2nd Edition by Jie Kang (Author)
- Bigger Leaner Stronger: The Simple Science of Building the Ultimate Male Body Paperback – March 15, 2019 by Michael Matthews
- The Plant-Based Boost: Nutrition Solutions for Athletes and Exercise Enthusiasts Paperback – May 27, 2019

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**B. Voc. Part – III, Semester - VI**  
**Nutrition and Dietetics**  
**Paper No – 604 - Clinical Testing/Food Analysis**

**Theory-4**

**Practical-4**

**Objective:**

To develop the skills on the quantification technique of various components, allergens present in food products. Learning Outcome: □ Students will have a thorough understanding on the working principle and instrumentation of various instruments used in food analysis. □ The students will know the importance of various methods to identify any malfunction aspect of food. 6 P.G. DEPARTMENT OF FSTN.

**UNIT-I Nature and Concept of Food analysis,**

Basic instrumentation: Principle for pH meter, Dialysis, ultra filtration, Reverse osmosis. Centrifugation: Principle, Theory (RCF, Sedimentation coefficient) and types of Rotors, Ultracentrifugation, Calorimetry: Bomb calorimeter, Principle of Rheological Analysis- Rheological parameters, rheological methods, instruments and application, Texture profile analysis, Densimetry, Refractometry,

**UNIT-II Spectroscopic analysis of food components,**

Principle, instrumentation & application of Colorimetric (colorimeter, colourflex), UV-Vis spectrophotometer, Spectrofluorometer, IR, Atomic Absorption Spectroscopy, Mass spectroscopy, NMR and ESR.

**UNIT-III Chromatography: Theory & Principle,**

chromatographic parameter (partition coefficient, capacity factor, retention & dead time, Resolution & their calculation), components of chromatography & types (paper, thin layer, partition) Advance chromatography: GC, HPLC, HPTLC (principle, instrumentation & application). Separation technique & analysis: Electrophoresis: Paper & gel electrophoresis, PAGE, iso-electric focusing, 2D electrophoresis, Immuno electrophoresis.

**UNIT-IV Isotopic & immune techniques:**

Principle & theory of isotopic method, types, measurement & detection of radioactivity, Autoradiography, Immuno-techniques, Principle, antigen-antibody interaction, enzymatic immune assay- ELISA and its types. Different immuno techniques of antigen detection in food sample.

**References:**

1. Bioinstrumentation by .Veerakumari,
2. Biochemical & Molecular biology techniques. by Wilson&Walker,
3. Food Chemistry, Aurand, L.W. and Woods, A.E. 1973.AVI, Westport.
4. Principles of Food Science: Part-I Food Chemistry. Fennema, O.R. Ed. 1976 Marcel Dekker, New York.
5. Methods in Food Analysis. Joslyn, M.A. Ed. 1970.Academic Press, New York.
6. Developments in Food Analysis Techniques-1. Applied Science King, R.D. Ed. 1978Publishers Ltd., London.
7. Separation Methods in Biochemistry 2nd Ed Morris, C.J. and Morris, P. 1976. PitmanPub., London.
8. An Introduction to Practical Biochemistry. Plummer, D.T. 1971Mc-Graw Hill Pub.Co., New York.
9. A Manualof Laboratory Techniques. Raghuramulu, N., Madhavan Nair, K., and Kalyanasundaram, S. Ed.1983.National Institute of Nutrition, ICMR, Hyderabad.

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**B. Voc. Part – III, Semester - VI**  
**Nutrition and Dietetics**  
**Paper No – 605 - Food Quality Control**

**Theroy-4**

**Practical-4**

S. No	Topic	Domain
<b>UNIT 1</b>	<p><b>Concept of quality attributes</b></p> <p>Physical, chemical, nutritional, microbial, and sensory.            Concepts of quality management.            Principles of quality control.</p> <p>1. Quality management systems in India; Sampling procedures and plans.            2. Food Safety organizations dealing with inspection, traceability and Labeling issues, International food standards.</p>	<p><b>Must Know</b></p> <p>Introduction to quality attributes            Concepts of quality attributes            Definition of quality management            Principles of quality control            Food safety organization</p> <p><b>Desirable to know</b>            Quality management system in India            Laws &amp; regulations</p>
<b>UNIT 2</b>	<p><b>HACCP</b></p> <p>Define, Principles            Uses</p> <p>How HACCP assists the food industry.</p>	<p><b>Must Know</b></p> <p>Introduction to HACCP            Definition of HACCP            Principles of HACCP            Role of HACCP in food industry</p> <p><b>Desirable to know</b>            Use of HACCP            Laws &amp; regulations</p>
<b>UNIT 3</b>	<p><b>Quality assurance,            Total Quality Management</b></p> <p>GMP/GHPGLP, GAP            Sanitary and hygienic practices            Quality manuals, documentation and audits            Indian &amp; International quality systems and standards like ISO and Food Codex            Export import policy and export documentation            Laboratory quality procedures and assessment of laboratory performance</p> <p>Applications in different food industries.</p>	<p><b>Must Know</b></p> <p>Introduction to quality assurance            Definition of quality assurance            Definition of total quality management            Role of HACCP in food industry            Application of quality assurance in food industry</p>

UNIT 4	<p><b>Quality control in food service institutions</b></p> <p><b>Introduction to the food and beverage sector</b></p> <p><b>Sectors of the foodservice industry</b></p> <p><b>Food and beverage operations</b></p> <p><b>Classifications of food service establishments</b></p> <p><b>Types of food and beverage services</b></p>	<p><b>Must Know</b></p> <p><b>Introduction to food &amp; beverage sectors</b></p> <p><b>Sectors of food service industry Classification</b></p> <p><b>Types of food &amp; beverage services</b></p> <p><b>Desirable to know</b></p> <p><b>Operation of food &amp; beverage industry</b></p>
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### References:-

1. Bauman, H.E., *The Hazard Analyses Critical Control Concept, in Food Protection Technology*, edited by C.W., Felix, Lewis Publishers, Chelsea, Michigan, 1987, pp.175–179.
2. Simonson, B., Bryan, F.L., Christian, J.H.B., Roberts, T.A., Tompkin, R.B., Silliker, J.H., *Prevention and Control of Food borne Salmonellosis Through Application of Hazard Analysis Critical Control Point (HACCP)*, International Journal of Food Microbiology, Vol. 4, 1987, pp. 227–247.
3. Shaw, S., Rose, S.A., *New Food Legislation and the Role of Quality Assurance*, Quality Forum, Vol. 17, No. 4, 1991, pp. 151–155.
4. The Quality Auditor's *HACCP Handbook*, ASQ Quality Press, Milwaukee, Wisconsin, 2002.
5. Pierson, M.D., Corlett, D.A., *HACCP Principles and Applications*, Van NostrandReinhold Company, New York, 1992.
6. Arthey, D., *Quality Control of Fruits and Vegetables and Their Products*, in *Quality Control in the Food Industry* edited by S.M. Herschdoerfer, Academic Press, London, 1986, pp. 217–260.
7. *Improving the Safety and Quality of Fresh Fruits and Vegetables: A Training Manual for Trainers*, published by the Joint Institute for Food Safety and Applied Nutrition (JIFSAN), University of Maryland, College Park, Maryland, USA, 2002.
8. Thorner, M.E., Manning, P.B., *Quality Control in Food Service*, The AVI Publishing Company, Westport, Connecticut, 1976.
9. ANSI Z1.15, *Generic Guidelines for Quality Systems*, American National Standards Institute, New York, 1980.

**SHIVAJI UNIVERSITY, KOLHAPUR**

**Practical Syllabus**

**B. Voc. Part – III, Semester - VI**

**Nutrition and Dietetics**

**Paper 606 : Lab Work - Sport Nutrition (Psychological & Counseling)**

Total Workload: 06

Total Marks - 50

Practical - 4 Lectures / Week / Batch of 20 Students

**Each one 2 practical's**

1. Types of Exercise
2. Gym Results
3. Fitness researches
4. Drawback of fitness

**Scheme of Practical Evaluation**

**50 Marks**

**Internal Practical Evaluation**

- |   |          |
|---|----------|
| 1) Prepare any one practical from the above | 20 Marks |
| 2) Practical record book                    | 20 Marks |
| 3) Viva - Voce                              | 10 Marks |

**References: \_**

- Nutrition and Metabolism in Sports, Exercise and Health 2nd Edition by Jie Kang (Author)
- Bigger Leaner Stronger: The Simple Science of Building the Ultimate Male Body Paperback – March 15, 2019 by Michael Matthews
- The Plant-Based Boost: Nutrition Solutions for Athletes and Exercise Enthusiasts Paperback – May 27, 2019

**SHIVAJI UNIVERSITY, KOLHAPUR**  
**Practical Syllabus**  
**B. Voc. Part – III, Semester - VI**  
**Nutrition and Dietetics**  
**Paper 607 : Lab Work - Clinical Testing/Food Analysis**

Total Workload: 06

Total Marks - 50

Practical - 4 Lectures / Week / Batch of 20 Students

**Each one 2 practical's**

- 1) Chromatography used to estimate food colour.
- 2) HPLC
- 3) Refractometer
- 4) Spectrophotometer

**Scheme of Practical Evaluation**

**50 Marks**

**Internal Practical Evaluation**

- |   |          |
|---|----------|
| 1) Prepare any one practical from the above | 20 Marks |
| 2) Practical record book                    | 20 Marks |
| 3) Viva - Voce                              | 10 Marks |

**References: \_**

1. Bioinstrumentation by .Veerakumari,
2. Biochemical & Molecular biology techniques. by Wilson & Walker,
3. Food Chemistry, Aurand, L.W. and Woods, A.E. 1973. AVI, Westport.
4. Principles of Food Science: Part-I Food Chemistry. Fennema, O.R. Ed. 1976 Marcel Dekker, New York.
5. Methods in Food Analysis. Joslyn, M.A. Ed. 1970. Academic Press, New York.
6. Developments in Food Analysis Techniques-1. Applied Science King, R.D. Ed. 1978 Publishers Ltd., London.
7. Separation Methods in Biochemistry 2nd Ed Morris, C.J. and Morris, P. 1976. Pitman Pub., London.



**SHIVAJI UNIVERSITY, KOLHAPUR**  
**Practical Syllabus**  
**B. Voc. Part – III, Semester - V**  
**Nutrition and Dietetics**  
**Paper 608 : Lab Work - Food Quality Control**

Total Workload: 06

Total Marks - 50

Practical - 4 Lectures / Week / Batch of 20 Students

**Each one 2 practical's**

- 1) HACCP in Food Industry
- 2) Estimation of Quality Measures in Food Industry.
- 3) Visit to Food Industry Production.
- 4) How to Measure food Quality in Foods.

**Scheme of Practical Evaluation**

**50 Marks**

**Internal Practical Evaluation**

- |   |          |
|---|----------|
| 1) Prepare any one practical from the above | 20 Marks |
| 2) Practical record book                    | 20 Marks |
| 3) Viva - Voce                              | 10 Marks |

**Reference Books:-**

1. Bauman, H.E., *The Hazard Analyses Critical Control Concept, in Food Protection Technology*, edited by C.W., Felix, Lewis Publishers, Chelsea, Michigan, 1987, pp.175–179.
2. Simonson, B., Bryan, F.L., Christian, J.H.B., Roberts, T.A., Tompkin, R.B., Silliker, J.H., *Prevention and Control of Food borne Salmonellosis Through Application of Hazard Analysis Critical Control Point (HACCP)*, International Journal of Food Microbiology, Vol. 4, 1987, pp. 227–247.
3. Shaw, S., Rose, S.A., *New Food Legislation and the Role of Quality Assurance*, Quality Forum, Vol. 17, No. 4, 1991, pp. 151–155.
4. *The Quality Auditor's HACCP Handbook*, ASQ Quality Press, Milwaukee, Wisconsin, 2002.
5. Pierson, M.D., Corlett, D.A., *HACCP Principles and Applications*, Van NostrandReinhold Company, New York, 1992.
6. Arthey, D., *Quality Control of Fruits and Vegetables and Their Products*, in *Quality Control in the Food Industry* edited by S.M. Herschdoerfer, Academic Press, London, 1986, pp. 217–260.

**SHIVAJI UNIVERSITY, KOLHAPUR**

**Practical Syllabus**

**B. Voc. Part – III, Semester - VI**

**Nutrition and Dietetics**

**Paper – 609 : Lab Work - Health Survey**

Total Workload: 06

Total Marks - 50

Practical - 4 Lectures / Week / Batch of 20 Students

**Scheme of Practical Evaluation**

**50 Marks**