

**UNIVERSITY OF RAJASTHAN**

**JAIPUR**


**SYLLABUS**

**Home Science**

**Career Oriented & Skill Development Course  
In  
Clinical & Nutrition & Dietetics**

- ‡ CERTIFICATE COURSE**
- ‡ DIPLOMA COURSE**
- ‡ ADVANCED DIPLOMA COURSE**

**Examinations-2018**

  
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## CLINICAL NUTRITION AND DIETETICS (CND)

These are add-on courses, which a regular student in UG or PG programme can pursue simultaneously. The certificate holder or a graduate in B.Sc. – Home

Science shall be eligible for admission to the Diploma in CND and the Diploma holder in CND or a post graduate in M.Sc.– Food and Nutrition shall be eligible for admission to the Advanced Diploma course in CND.

Candidates who have passed 10+2 examination from a recognized board shall be considered eligible for admission to the Certificate Course.

Nomenclature of the course	Duration	Eligibility Criteria
Certificate in Clinical Nutrition And Dietetics	1 academic year	10+2 of any recognized board
Diploma in Clinical Nutrition and Dietetics	1 academic year	Certificate in Clinical Nutrition and Dietetics Or Graduate in B Sc .Home Science
Advanced Diploma in Clinical Nutrition and Dietetics	1 Academic year	Diploma in Clinical Nutrition and Dietetics Or Post Graduate in Food and Nutrition

### Teaching Schedule


The classes shall be conducted in the morning/evening hours. Apart from the regular faculty, senior professionals from the Quality Control units of various Hospitals And Health Centers, experienced doctors and dietitians shall be invited to offer guidance on the contemporary and technical aspects of the subjects under study.

### Pedagogical Strategies

Apart from classroom lectures, activities and assignments, students shall be given opportunities to present and participate in seminars and symposia.

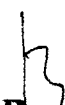
### Annual Scheme of Examination

1. The number of papers and the minimum passing and maximum marks for each paper shall be shown in the syllabus. Each theory paper will be of three hours duration and the duration of practical examination shall be as prescribed in the syllabus.

  
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2. There shall be 3 sections in the question paper. Section 1 shall consist of objective type questions, section 2 shall consist of definitions/short answers type questions and section 3 shall consist of long essay type questions.
3. Result categorization: Pass with distinction.75% , I Div.60% and Pass 50% in the aggregate.
4. To pass the examination, a candidate is required to obtain at least 40% marks individually in the Internal Assessment and Annual Examination in each paper (theory & practical separately as prescribed in the syllabus).
5. Candidate needs to clear all papers in order to be eligible for promotion to the next level of courses.
6. A candidate failing in a maximum of one paper shall be allowed to take the exam in that paper only in the immediately successive year, otherwise, she will be required to appear in all papers..
7. Internal assessment will constitute 30% marks of the maximum marks for each paper (theory and practical separately) based on internal examinations, submissions and regularity in attendance.
8. A candidate passing the Certificate course shall only be admitted to the Diploma course.
9. A candidate passing the Diploma course shall only be admitted to the Advanced Diploma course.
10. A candidate with B.Sc. Home Sc. shall be eligible for direct admission to Diploma and M.Sc. Home Sc. (Foods & Nutrition) shall be eligible for direct admission to Advanced Diploma course.
11. The Certificate/ Diploma/ Advanced Diploma shall be awarded by the university of Rajasthan.

  
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## CLINICAL NUTRITION AND DIETETICS

### Certificate Course

Serial No.	Paper	Credit Hour	Time Duration/ week (hrs.)	Distribution of Marks				Exam Duration (hrs.)
				Max. Marks	Min. Marks	Internal Assessment	External Assessment	
D 101	Human Physiology THEORY	5	3	100	40	30	70	3
D	Basic Nutrition And Meal Management THEORY	5	3	100	40	30	70	3
D	Basic Nutrition And Meal Management PRACTICAL	10	6	200	80	60	140	3
D 104	Project/ Field work	10	6	200	80	70	130	6
TOTAL		30	18	600				


### Diploma Course

Serial No.	Paper	Credit Hour	Time Duration/ week (hrs.)	Distribution of Marks				Exam Duration (hrs.)
				Max. Marks	Min. Marks	Internal Assessment	External Assessment	
D 201	Clinical Nutrition and Dietetics - II THEORY	5	3	100	40	30	70	3
D	Problems in Human Nutrition THEORY	5	3	100	40	30	70	3
D	Clinical Nutrition and Dietetics PRACTICAL	10	6	200	80	60	140	3
D 204	Internship	10	6	200	80	70	130	6
TOTAL		30	18	600				

  
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## Advanced Diploma Course

Paper Code.	Paper	Credit Hour	Time Duration/ week (hrs.)	Distribution of Marks				Exam Duration (hrs.)
				Max. Marks	Min. Marks	Internal Assessment	External Assessment	
ND 301	Clinical Nutrition and Dietetics II THEORY	5	3	100	40	30	70	3
ND 302	Community Nutrition THEORY	5	3	100	40	30	70	3
ND 303	Community Nutrition PRACTICAL	10	6	200	80	60	140	3
ND 304	Internship	10	6	200	80	70	130	6
TOTAL		30	18	600				

  
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**CERTIFICATE COURSE IN CLINICAL NUTRITION  
AND DIETETICS**

**Paper I : HUMAN PHYSIOLOGY  
(THEORY)**

**Credit Hour - 05**

**Contact Hrs./ week -03**

**Total Hrs -75**

**Objectives:**

*To enable the students to*

*To acquire knowledge regarding the human body*

*To know in detail about various systems of body*


**Contents:**

Structure and functions of ;-

- Cell and Tissues
- Circulatory System
- Lymphatic System
- Digestive System
- Excretory System
- Nervous System
- Endocrine System
- Sense Organs
- Skeletal system

**Books Recommended:**

1. Keele, C.A. and Neil, E. (1978) Samson Wright's Applied Physiology, Oxford University Press
2. Tortora, G.J. and N. P. Anagnostakos (1984), Principles of Anatomy and Physiology, Harper and Row Publisher, New York
3. Armstrong, K.F. Anatomy and Physiology for Nurses
4. Pearce, A. Anatomy and Physiology for Nurses, Faber and Faber Lt
5. Sears, W. G. Anatomy and Physiology for Nurses

  
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**Paper II : Basic Nutrition and Meal Management  
(THEORY)**

**Credit Hour - 05**

**Contact Hrs./ week -03**

**Total Hrs -75**

**Objectives:**

*To enable the students: -*


*To understand the relationship between nutrition and human well being.*

*To acquire knowledge regarding principles of planning diets for various stages of life cycle and diseases.*

*To understand the general structure and functions and various systems and organs in the body*

**Contents:**

1. Introduction to nutrition – definition of nutrition, nutrients and health
2. Basic 5 food groups, food guide, food pyramid
3. Macro nutrients – carbohydrates, fats and proteins. Composition, classification, food sources, functions, requirements, deficiency and storage in body, metabolism.
4. Micro nutrients – minerals, fat-soluble vitamins and water-soluble vitamins  
Composition, classification, sources, functions, requirements, deficiency and Storage
5. Water – functions, requirements, sources and balance
6. Introduction to meal management - balanced diet
7. Basic principles and steps in meal planning
8. Nutrition during the life cycle
  - Pregnancy
  - Lactation
  - Infancy
  - Pre-school
  - School age
  - Adolescence
  - Elderly
9. Therapeutic Nutrition
  - Role of dietitian and Nutritionist
  - Basic concept of diet therapy

  
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- Therapeutic adaptation of normal diet
- Dietary counselling
- Obesity – causes, prevention and dietary modification
- Etiology, symptoms and diet in gastro Intestinal diseases – diarrhea (acute and chronic), constipation ( atonic and spastic)
- Hypertension
- Diabetes Mellitus
- Nutritional Anaemia

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**Paper III : Basic Nutrition and Meal Management  
(PRACTICAL)**

**Credit Hour - 10**

**Contact Hrs./ week -06**

**Total Hrs -150**

**Objectives:**

*To enable the students:*

*To learn planning and preparation of different types of diets*

**Contents:**

1. Planning, preparation and serving of diet during pregnancy, lactation, Infancy, school age, adolescence and Elderly.
2. Planning and preparation of Therapeutic diets covered in the theory- obesity, diarrhea, constipation, anaemia, diabetes mellitus, hypertension.
3. Assessment of nutritional status – anthropometry, dietary intake, hemoglobin assessment, clinical.

**Books Recommended:**

1. Guthrie H.A. 'Introductory Nutrition' Mosby Publications. 1988
2. Mudambi S.R. and M.V. Rajgopal. 'Fundamentals of Food & Nutrition' II Edition. Wiley Eastern Limited. 1990.
3. Antia F.P. 'Clinical Dietetics and Nutrition'. III Edition. Oxford University Press. Bombay, 1989.
4. Modern Nutrition in Health and Disease. Shils, M.E. and Young V.R. Bombay K.M. Varghese Company (vi edition 1988)
5. Kinder, F. Meal Management Truswell, A.S. and Mann, J. Essentials of Human Nutrition. Oxford University Press
6. Sharma, S. Human Nutrition and Meal Planning . Jnanada Prakashan (P&D), New Delhi
7. Robinson C.H., Lawler M.R. 'Normal and Therapeutic Nutrition'. Macmillan Publishing Company. 17<sup>th</sup> Edition. 1986.
8. Krause, M.V. Food, Nutrition and Diet Therapy, W. B. Saunders Co. Philadelphia.

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Project / Field Work

- On topics from Human Physiology, Basic Nutrition and Meal Management
- Field work from hospitals, Anganwadi and Community.
- A report will be submitted and presentation should be made.

Report 3 credits  
Presentation 2 credits

**Evaluation:** External assessment will be made based on project report and viva voce

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**DIPLOMA COURSE IN CLINICAL NUTRITION  
AND DIETETICS**

**Paper I : Clinical Nutrition And Dietetics-I  
(THEORY)**

**Credit Hour - 05**

**Contact Hrs./ week -03**

**Total Hrs -75**

**Objectives:**

*This course shall enable the students -*

*To acquire knowledge regarding effect of various diseases on nutritional status*

*To gain knowledge in diet counseling and educating patients*

**Contents:**

1. Incidence, etiology, pathology and metabolic aberrations, clinical manifestations, complications and dietary management and counseling for the following diseases-

- GIT Diseases – peptic ulcer, ulcerative Colitis, Malabsorption Syndrome
- Carbohydrate and Fat intolerance – Sprue, Celiac disease
- Liver disease –Hepatitis, Cirrhosis
- Diseases of Pancreas and Gall bladder

2. Incidence, etiology, pathology and metabolic aberrations, clinical manifestations, complications and dietary management and counseling for Heart diseases-  
Cardiovascular diseases – Hypertension, Atherosclerosis, Hyperlipidemia, Coronary Heart diseases

3. Incidence, etiology, pathology and metabolic aberrations, clinical manifestations, complications and dietary management and counseling for Diabetes-  
- Diabetes mellitus (Juvenile and adult onset types), Type of insulin and their action, Oral hypoglycemic drugs

4. Incidence, etiology, pathology and metabolic aberrations, clinical manifestations, complications and dietary management and counseling for Renal diseases-  
- Renal diseases – Glomerulonephritis, Nephrotic Syndrome.  
Renal failure (acute and chronic).

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**Paper II : Problems in Human Nutrition  
(THEORY)**

Contact Hrs./ week -03

Total Hrs -75

**Objectives:**

*This course shall enable the students to :*

- Making students aware of the nutrition related problems in the community and the resources to prevent or cure them*
- Evaluating and interpreting parameters of nutritional status assessment*

**Contents:**

1.    Macronutrient deficiency diseases- prevalence, etiology, biochemical and clinical manifestations, preventive and therapeutic measure for the following nutritional problems.
    - Protein Energy Malnutrition (Severe Acute Malnutrition)
    - Osteoporosis
    - Fluorosis
  
  2.    Micronutrient deficiency diseases-prevalence, etiology, biochemical and clinical manifestations, preventive and therapeutic measure for the following nutritional problems.
    - Iron Deficiency Anemia (IDA)
    - Iodine Deficiency Disorder (IDD)
    - Vitamin A Deficiency (VAD)
    - Zinc
  
  3.    Food safety and contamination
    - Food Hazards-Chemicals, antibiotics, hormones, metals, Poisons.
    - Food contamination- water, air, sewage, soil, humans, animals, birds.
    - Safety in food procurement, storage, handling & preparation, control of spoilage
- Naturally occurring and anti nutritional factors causing Lathyrism, Epidemic dropsy.
- Chemical contamination of food- heavy metal and pesticide residue.
  - Fungal contamination – Aflatoxic hepatitis, enterotoxism and mycotoxicoses.

**Books Recommended:**

1.    McCullum, E.V. (1957) : History of Nutrition, Houghton Mifflin Co.
2.    Waterlow, J.C. (1992) Protein Energy Malnutrition, Edward Arnold, A Division of Hodder & Stoughton.
3.    Bauernfeind, J. Christopher (Ed.) (1986) : Vitamin and its Control, Academic Press.
4.    WHO (1970) : Fluorides and Human Health.
5.    Rajiv Gandhi National Drinking Water Mission. (1993) : Prevention and Control of Fluorosis Ministry of Rural Development.

  
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6. Beaton, G.H. and Bengoa, J.M. (Eds) (1976) : Nutrition in Preventive Medicine, WHO.
7. Gopalan, C. (Ed) (1993) Recent Trends in Nutrition, Oxford University Press.
8. DeMaeyer, E.M. (1989) : Preventing and Controlling Iron Deficiency Anaemia through Primary Health Care, WHO.
9. Sachdeva, H.P.S., Chaudhary, P. (Eds) (1994) : Nutrition in Children Developing Country Concerns, Dept. of Pediatrics, Maulana Azad Medical College, New Delhi.
10. Shils, M.E., Olson, J.A., Shike, N. and Ross, A.C. (Ed) (1999) : Modern Nutrition in Health & Disease, 9th Edition, Williams and Wilkins.
11. Mahan, L.K. & Ecott-Stump, S. (2000) : Krause's Food, Nutrition and Diet Therapy, 10th Edition, W.B. Saunders Pvt. Ltd.
12. Publications of the International Life Science Institute.
13. UNICEF's State of the World's Children.
14. World Health Organizations Reports, Monographs and Technical Report Series.
15. McLaren, D.S. (1992) A Colour Atlas and Text of Diet-Related Disorders.
16. Bamji, M.S., Rao, P.N. and Reddy, V. (Eds) (1996) : Textbook of Human Nutrition, Oxford & IBH Publishing Co. Pvt. Ltd.

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**Paper III : Clinical Nutrition and Dietetics  
(PRACTICAL)**

**Credit Hour - 10**

**Contact Hrs./ week -06**

**Total Hrs -150**

**Objective:**

*This course will enable the students to:*

*To plan and prepare diets for patients suffering from various diseases covered in theory.*

**Contents :**


Planning and preparation of diets in the following diseases-

- GIT Diseases –Peptic ulcers, Ulcerative Colitis
- Liver disease –Hepatitis, Cirrhosis, Hepatic coma.
  - Heart disease – Hyperlipidemia, Hypertension, myocardial infarction (with obesity, diabetes)
- Pancreatitis
- Diabetes mellitus (with obesity/hypertension/ hyperlipidemia)
- Diseases of Gall bladder (with obesity)
- Renal diseases – Glomerulonephritis, Nephrotic Syndrome
- Special feeding methods (Market survey of enteral, parenteral and oral feeds)

Visits to Anganwadi Centre, a hospital, a community

**Books Recommended:**

- Shils, M.E. and Young V.R. (vi edition 1988) Modern Nutrition in Health and Disease. Bombay K.M. Varghese Company
- Antia, F.P. (1989) Clinical Dietetics and Nutrition. Oxford University Press, Bombay, 3<sup>rd</sup> Edition
- Passmore, P. and M.A. Eastwood. (1986). Human Nutrition and Dietetics. ELBS, Churchill, Livingstone, 8<sup>th</sup> Edition
- Mahan, L.K. & Ecott-Stump, S. (2000) : Krause's Food, Nutrition and Diet Therapy, 10<sup>th</sup> Edition, W.B. Saunders Pvt. Ltd.
- Robinson C.H., Lawler M.R. 'Normal and Therapeutic Nutrition'. Macmillan Publishing Company. 17<sup>th</sup> Edition. 1986.

  
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## Paper IV : INTERNSHIP

### INTERNSHIP:

In the end of Diploma course, students will undergo internship training of one month-60 hrs in a hospital/ health clinic/ analytical labs/ food processing units/ food industries/ catering units/ NGOs etc. so that they get to understand the existing working practices, conditions and acquire an in depth technical know how. The student shall prepare a report on the visit made to the organization. She will submit the report and will be required to make the presentation of the work followed by viva-voce. The students will be required to get the certificate regarding successful training.

Evaluation: Panel of examiners consisting of Head of the department, and another examiner appointed by the university shall conduct a vice-voce and evaluate the reports. The students will be marked accordingly.

  
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# ADVANCED DIPLOMA COURSE IN CLINICAL NUTRITION AND DIETETICS

## Paper I : Clinical Nutrition and Dietetics - II (THEORY)

Credit Hour - 05

Contact Hrs./ week -03

Total Hrs -75


### Objectives:

*This course shall enable the students -*

- To understand the body composition and pattern of growth and its relationship with nourishment level
- To develop skills and techniques in planning and preparation of advanced therapeutic diets.

### Contents:


1. Body composition, measurement and significance
  - Biochemical composition
  - Lean body weight and fat free body weight ,Body Cell Mass
2. Growth and development
  - General aspects of physical growth, cellular growth, adjustment at birth
  - Prenatal and postnatal malnutrition
  - Gerontology ageing process
3. Energy metabolism
  - Units of energy
  - measurement of energy expenditure by direct and indirect calorimetry
  - Basal metabolic rate, respiratory quotient, specific dynamic action
  - Factors effecting BMR
  - Prerequisites of measuring BMR and RMR
  - Specific dynamic action of food
  - Regulation of energy balance
    - Inborn errors of metabolism of carbohydrate, protein & Lipids
4. Incidence, etiology, pathology, clinical manifestations, complications, dietary management and counseling in:
  - Surgery
  - Burns
  - Allergy
  - Cancer
  - Dental caries
  - Gout
  - Eating Disorders –Anorexia nervosa, Bulimia nervosa
  - AIDS and nutrition

  
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**Books Recommended:**

1. Antia F.P. 'Clinical Dietetics and Nutrition'. III Edition. Oxford University Press. Bombay, 1989. Modern Nutrition in Health and Disease. Shils, M.E. and Young V.R. Bombay K.M. Varghese Company (vi edition 1988)
2. Passmore, P. and M.A. Eastwook. (1986). Human Nutrition and Dietetics. ELBS, Churchill, Livingstone, 8th Edition
3. Shils, M.E. and Young V.R. (1988). Modern Nutrition in Health and Disease. Bombay K.M. Varghese Company (VI edition)
4. Mahan, L.K. & Ecott-Stump, S. (2000). Krause's Food, Nutrition and Diet Therapy, 10th Edition, W.B. Saunders Pvt. Ltd.
5. Pike and Brown: Nutrition – An integrated approach – John Wiley and sons, New York
6. Robinson C.H., Lawler M.R. 'Normal and Therapeutic Nutrition'. Macmillan Publishing Company. 17th Edition. 1986.

  
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**Paper II : Community Nutrition  
(THEORY)**

**Credit Hour - 05**

**Contact Hrs./ week -03**

**Total Hrs -75**

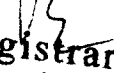
**Objectives:**

*This course shall enable the students*

*To recognize the solutions for overcoming problems of malnutrition in the community.*

**Contents:**

1. Introduction to Extension Education : Principles & Methods
2. Concept: community health, health care, health delivery systems.
3. Causes of malnutrition, methods of assessment of nutritional status of the individual and the community.
4. Nutrition and Infection.
5. Economics of malnutrition
6. Nutritional surveillance
7. Programme planning
8. National Policies and Programmes.
  - National policies on Health and nutrition
  - National Nutrition programmes.
  - National Rural Health Mission.
  - International agencies - WHO,FAO, UNICEF, CARE,UNESCO
9. Strategies for improving nutritional status:
  - Health based interventions – Immunization, safe drinking water, Reproductive Health.
  - Food based Interventions – Supplementary feeding, food fortification and bio-fortification.
  - Education based interventions. – Nutrition communication for behavioural change.

  
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**Paper III : Community Nutrition  
(PRACTICAL)**

**Credit Hour - 10**

**Contact Hrs./ week -06**

**Total Hrs -150**

**Objectives:**

*This course shall enable the student :*

*To develop low cost recipes-weaning foods for infants and supplementary foods for all ages.*


*Identification of the problem ,planning and implementation of several community based projects*

**Contents:**

1. Development of low cost nutritional recipes suitable for various vulnerable sections.
2. Planning and conducting nutrition education programmes for community using different extension methods and audio visual aids.
3. Market Survey of the commercially available formulae (for infants, old age etc.)
4. Project / Seminar. Topics of Contemporary issues on clinical nutrition and dietetics and Community Nutrition based on latest research across the globe.

**Books Recommended:**

1. Shukla P.K. (1982) Nutritional Problems of India – Prentice Hall of India Pvt. Ltd., New Delhi.
2. McLarea D.S. (Ed) 1983. Nutrition in the Community. John Wiley & Sons
3. Jellife D.B. (1966). The Assessment of Nutritional Status of the Community. WHO Monograph series no. 53. Geneva.

  
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## Paper IV: INTERNSHIP

### INTERNSHIP:

In the end of Advance Diploma course, students will undergo internship training of one month -60Hrs in a hospital/ health clinic/ analytical labs/ food processing units/ food industries/ catering units/ NGOs etc. so that they get to understand the existing working practices, conditions and acquire an in depth technical know how. The student shall prepare a report on the visit made to the organization. She will submit the report and will be required to make the presentation of the work followed by viva-voce. The students will be required to get the certificate regarding successful training.

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