



ರಾಜೀವ್ ಗಾಂಧಿ ಆರೋಗ್ಯ ವಿಜ್ಞಾನಗಳ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಕರ್ನಾಟಕ, ಬೆಂಗಳೂರು
RAJIV GANDHI UNIVERSITY OF HEALTH SCIENCES, KARNATAKA, BENGALURU
4th T Block, Jayanagar, Bengaluru - 560 041

No. RGU/AUTH/128-SYN/187/2017-18

Date. 01.09.2017

NOTIFICATION

Sub: Ordinance governing Regulations and Curriculum for MD Diet and Nutrition in Naturopathy and Yoga.

Ref: Minutes of the 128th Syndicate Meeting held on 23.08.2017

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As per the decision of the Syndicate in its 128th meeting held on 23.08.2017 and in exercise of the powers conferred under section 35(2) of RGUHS Act, 1994, Ordinance governing Regulations and Curriculum for MD Diet and Nutrition in Naturopathy and Yoga is notified as per Annexure-1.

The said Ordinance comes into effect from the academic year 2017-18 onwards.

By Order


REGISTRAR

To

Principals of all affiliated colleges conducting MD Diet and Nutrition in Naturopathy and Yoga.

Copy to :-

1. The Secretary to Governor, Governors Secretariat, Raj Bhavan, Bengaluru- 560 001
2. The Secretary to Government, Health & Family Welfare Department (Medical Education), M.S. Building, Bengaluru- 560 001
3. The Director, Department of Medical Education, Ananda Rao Circle, Bengaluru- 560 009
4. PA to Vice-Chancellor/Registrar/Registrar(Evaluation)/Finance Officer
5. Director, Curriculum Development Cell
6. Deputy Registrar, Admission/Affiliation
7. The homepage of RGUHS Website
8. Guard File/Office copy

**Ordinance Governing Regulations
And Curriculum for MD Diet and
Nutrition in
Naturopathy and Yoga, 2017**

Annexure no: 1

SYLLABUS

MD Diet and Nutrition in Naturopathy and Yoga

PAPER-1: Philosophy and Practice of Naturopathy and Yogic Diet and Basic Nutrition.

PAPER -2 : Diagnosis through Convention Medicine and Management of diseases in Nutrition and Dietetics

PAPER-3: Diagnosis through Convention Medicine and Management of diseases in Nutrition and Dietetics

Paper -4: Research Methodology and Recent Advances in Clinical Nutrition and Dietetics.

PAPER-1:

Philosophy and Practice of Naturopathy and Yogic Diet and Basic Nutrition.

Philosophy evolution history of naturopathic diet

- **Eliminative diet**
- **Soothing diet**
- **Constructive diet**

Philosophy evolution history of juice therapy

Philosophy evolution history of yogic diet

- **Satwik Diet**
- **Rajasik Diet**
- **Tamsik Diet**

PAPER -2

Applied Nutrition and Dietetics

Applied Nutrition and dietetics

1. Menu Planning
 - Rationale for menu planning
2. Factors affecting food choice
 - Nutritional factors
 - Other factors

Exchange list Vs food composition tables for menu planning

- Steps in the development of exchange list

Planning for adults

Based on Recommended daily allowances

Pregnancy and lactation

Physical changes during pregnancy

- Expansion in plasma volume and red cell mass
- Hormonal profile in pregnancy
- Placental transfer of nutrients
- Maternal weight gain.

Nutritional needs during pregnancy

Maternal nutrition and fetal outcome:

Guidelines for planning balanced diet for elderly

Sport Nutrition

- ❖ Introduction
- ❖ Evaluation and growth of sports nutrition as a discipline
- ❖ Anthropometric and physiological measurement.
 - Various techniques for measuring body composition.
 - Work capacity

Physical fitness

- Parameter of fitness
- Fitness tests

Nutritional requirements for extreme environments

General adaptive mechanisms to environmental extreme and role of nutrition in successful acclimatization.

- ❖ Health Hazards associated with high altitude
- ❖ Nutritional requirements in high altitude

Nutritional requirements in high cold and polar envelopment

- ❖ Nutritional requirements in hot environments
- ❖ Nutritional requirements for space missions

Nutritional regulation of Gene Expression, Epigenetic & Nutrigenomics

- ❖ Introduction
- ❖ Gene - Expression- An overview
- ❖ Role of specific nutrients in controlling gene expression
- ❖ Proteins
- ❖ Lipids
- ❖ Minerals
- ❖ Vitamins

Immunonutrition

- ❖ Role of specific nutrients in immune suppression.
- ❖ Role of nutrients in immune promotion

Functional foods and nutraceuticals in health disease

- ❖ History
- ❖ Definition
- ❖ Classification
- ❖ Physiological effects, effects of human health and potential applications in risk reduction of diseases.

Medical Nutrition therapy

1. Definition
2. Nutritional screening
3. Nutritional care process
 - ❖ Nutritional Assessment

PAPER -3

Management of diseases through in Nutrition and Dietetics

Nutritional care in disease condition

Nutritional management in infection and fever

- ❖ Defense mechanism
- ❖ Metabolic changes during infection
- ❖ Classification and entity of fever infection
- ❖ Typhoid/ TB / parasitic infestation/ Aids

Nutritional management of physiological stress

Nutrition in wound healing

Surgery: Pre and post surgical dietary management

Burns

- Classification
- Complication
- Dietary management
- Trauma: Dietary management
- Sepsis: Dietary management

Nutritional management of GI diseases:

Physiological and functional changes and impact on Nutritional status

Diseases of Esophagus and stomach

- Esophagitis(GERD)
- Dyspepsia
- Peptic ulcer
- Gastritis
- Gastrectomy: Dumping syndrome

Intestinal diseases

- Flatulence
- Diarrhea
- Constipation, Hemorrhoids, Diverticular disease
- Duodenal ulcer
- Inflammatory Diseases of Bowel: Crohn's disease and ulcerative colitis
- Irritable bowel syndrome
- Colostomy
- Ileostomy

Malabsorption syndrome

- Etiology
- Symptoms and complications
- Dietary management

Inborn errors of metabolism

- PKU
- MSUD
- Tyrosinosis
- Homocystinurias
- Glycogen storage disorders
- Galactosemia
- Organic acidurias
- Other types

Nutritional Management on Weight imbalance

- Regulation of food intake and pathogenesis of obesity and malnutrition and starvation.
- Weight Imbalance: prevalence and classification.
- Guidelines for calculating desirable body weight.
- Control of appetite and food intake: Neural count, Hormonal count, Insulin, estrogen and other types of peptide hormones.

Obesity:

- Etiology
- Energy balance
- Health risks

Management

- Diet and lifestyle modification
- Evaluation of some common diets
- Preventive aspects

Underweight

- Etiology
- Diet management

Nutritional management of eating disorders

- Anorexia Nervosa
- Bulimia

Nutritional management in coronary heart disease

Pathogenesis, role of nutrients in prevention and management – Nutritional and metabolic implications of dyslipidemias.

CHD

- Prevalence
- Etiology and risk factors

- Food selection
- Food allergy in infancy: Milk sensitive enteropathy, intolerance to breast milk.
- Prevention of food allergy

Reference books

1. Modern Nutrition in Health and Disease 10th edition by Maurice E. Shils
2. Alfred H.Katz. Prevention and health, the Haworth, Press, New York 1999.
3. Nutritional biochemistry of vitamins David a bendor.
4. Achayya, K.T.:(1998) A Historical Dictionary Of Indian Foods, Oxford Publishing Co.
5. Mahindru, S.N. (2002). Food Additives Characteristics, Detection and Estimation. Tata McGraw-Hill Publishing Co. Ltd. New Delhi.
6. Research Methodology By C.R Kothari
7. International Life Sciences Institute Present Knowledge in Nutrition - latest edition
8. Swaminathan S.: Advanced Textbook On Food & Nutrition Vol. 1 & N (2nd Ed. Revised Enlarged) Bapp Co. 1985.
9. Robinson. Basic Nutrition And Diet Therapy (8th Edition)
10. Robinson. Lawler: Normal & Therapeutic Nutrition (17th Ed.) Macmillan Publishing Co. 1986.
11. Davis J. and Sherer, K. (1994): Applied Nutrition and Diet Therapy for Nurses, 2nd edition. W.B. Saunders Co.
12. Davidson's Human Nutrition -- Geissler.
13. Nutrition and Biochemistry for Nurses by Jacob Anthikad
14. Willims S. R.: Essentials of Nutrition and Diet Therapy, 4th ed., Mosby College Pub. S. Louis, 1986.
15. Thomas. B.: Manual of Dietetic Practice, 1996.
16. L. MatareseGottschlich Contemporary Nutrition Support Practice. Saunders 1998
17. ASPEN: Nutrition Support, Dietetics
18. Clinical dietetics and nutrition by F.P Antia and Philip Antia.

- ❖ Tests of significance (parametric) – t test (paired and unpaired), Chi square test and test of proportion.
- ❖ Correlation and Regression :
- ❖ Scatter diagram, concept and properties of correlation coefficient, examples (No computation Simple correlation) Pearson's and spearman's, testing the significance of correlation coefficient.
- ❖ Linear and multiple regressions.
- ❖ Synthesizing the evidence: integration of the evidence using both quantitative and qualitative methods; principles of meta-analysis.
- ❖ Formulating recommendations and writing the review.

Reference Books

22. Lubert Stryer 'Biochemistry'
 23. Medical Textbook Of Biochemistry Chaterjee.
 24. Lehninger A. L. (1990) 'Principles of Biochemistry' New Delhi - CBS Publisher and Distributor.
 25. Modern Nutrition in Health and Disease 10th edition by Maurice E. Shils
 26. Alfred H.Katz. Prevention and health. the Haworth, Press, New York 1999.
 27. Nutritional biochemistry of vitamins David a bendor.
 28. Achayya, K.T.:(1998) A Historical Dictionary Of Indian Foods, Oxford Publishing Co.
 29. Mahindru, S.N. (2002). Food Additives Characteristics, Detection and Estimation. Tata McGraw-Hill Publishing Co. Ltd. New Delhi.
 30. Research Methodology By C.R Kothari
 31. International Life Sciences Institute Present Knowledge in Nutrition - latest edition
 32. Swaminathan S.: Advanced Textbook On Food & Nutrition Vol. 1 & N (2nd Ed. Revised Enlarged) Bapp Co. 1985.
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6. Assessing and planning diet for patients with Type I and II DM with and without complications and on different modalities of treatment
7. Planning diet for compensated and decompensated Liver failure condition
8. Planning diet for individual with hypertension.
9. Planning diet for RF
10. Planning diet for patient on dialysis (HD & PD)
11. Planning diet for post transplant renal patient
12. Assessment and planning diet for post burn condition
13. Assessment and planning diet for HIV with and without co-morbidities.
14. Assess factors contributing for poor nutritional status in cancer patient and plan diet based on the treatment.

Model question paper

MSC clinical nutrition

PAPER – I

(National and international recommendation of nutrient requirements, carbohydrates, proteins, lipids, water, research methodology and biostatistics.)

Time: 3hrs

Max Marks: 100

Section A (50 marks)

INSTRUCTIONS:

- Write section A & B in separate answer booklets
- Mention the question numbers properly
- Mention your roll number and name correctly
- Answer should be brief and relevant. Illustrate your answers

1. Enumerate the various components of energy expenditure, highlighting the factors that influence energy expenditure and requirement. **(10)**

Write Short notes

7x4=28

2. BMR and factors affecting BMR
3. Dietary modifications for the elderly

11. Mention any two biochemical indices to assess the quality of protein.
12. Intake of transfatty acid is harmful. Justify the statement?
13. What do you mean by the term food fortification? Give two examples
14. Justify why cereals and pulses have to be supplemented mutually.

Paper II

15. Explain how biochemically you can differentiate between Iron deficiency and megaloblastic anemia.
16. Prescribe a diet plan for a patient with diabetes mellitus .add a note on sweeteners and sugar substitutes
17. (10)
18. Describe the role of nutrients and food additives in cancer. (15+5 = 20)

Write short notes on

6x10 = 60

19. Total Parenteral nutrition
20. Malabsorption syndrome
21. Nutritional management of anorexia nervosa
22. Phenylketonuria and its nutritional management
23. Pre and post surgical dietary management
24. Assessment of vitamin A deficiency

Practicals: 100 marks

Duration of exam – one day

1. Assessing the nutritional status of an individual using different malnutrition assessment tools as appropriate.
2. Assessing requirements and planning diet for any one disease condition.

PAPER -4

Research Methodology and Recent Advances in Clinical Nutrition and Dietetics.

RESEARCH METHODOLOGY

- ❖ Basic principles of biostatistics and research methodology, sample size calculation analysis of data, , types of studies randomization. clinical trials,
- ❖ Basic reviewing quantitative and qualitative literature. carry out an appropriate, rigorous review of the literature; and understand the strengths and weaknesses of different methods of identifying, assessing and synthesizing literature.
- ❖ Planning the review: the role of the literature review and specification of the task
- ❖ Identification of relevant literature, both published and unpublished: developing a search strategy and using bibliographic databases.
- ❖ Appraising the literature: methods for assessing the quality of quantitative and qualitative research.

BIOSTATISTICS

- ❖ Introduction to Biostatistics
- ❖ Definition, role of statistics in health science and health care deliverySystem
- ❖ Sampling Population, sample, sampling, reasons for sampling, probability and non-probability sampling
- ❖ Methods of probability sampling-simple random, stratified, systematic procedure, merits and demerits. Use of random number table.
- ❖ Organization of data
- ❖ Frequency table, histogram, frequency polygon, frequency curve, bar diagram, pie chart
- ❖ Measures of location Arithmetic mean, median, mode, quartiles and percentiles -- definition, computation (for raw data), merits, demerits and applications.
- ❖ Measures of variation:Range, inter --quartile range, variance, standard deviation, coefficient of variation- definition, computation (for raw data), merits, demerits and applications.skewness and kurtosis.
- ❖ Basic probability distributions.
- ❖ Concept of probability distribution, Normal, Poisson and Binomial distributions, and application. Concept of sampling distributions.Standard error and confidence intervals.
- ❖ Tests of significance :
- ❖ Basic of testing of hypothesis – Null and alternate hypothesis, type I and type II errors, level of significance and power of the test, p value.

- Diagnostic tests
- Nutrition management

Common disorders of CHD and Nutrition management

- Dyslipidemias
- Atherosclerosis
- Hypertension
- IHD
- CCF
- Rheumatic heart disease

Nutrition Management of Renal Disease

Diseases of renal system: etiology and pathogenesis: change in function with progression of diseases, metabolic and nutritional implications.

- Clinical and metabolic manifestations
- Diagnostic tests

Types

- Acute and chronic nephritis
- Nephrotic syndrome
- Renal Failure: Acute and chronic
- ESRD

Nutritional management in cancer

Cancer: Pathogenesis and progression of cancer

Role of Nutrients and food additives in cancer therapies and their nutritional implications.

Types

- Symptoms
- Diagnosis
- Cancer therapies: Nutritional implications
- Dietary management

Nutrition management in Diseases of nervous system and musculoskeletal system

- Dysphagia
- Epilepsy
- Hyperkinetic behavior syndrome

Etiology dietary treatment in arthritis and osteoporosis

Nutritional management in Allergy

- Definition, symptoms mechanism of food allergy
- Biochemical and immune testing (Brief)
- Elimination diets

- Celiac disease (Tropical sprue)
- Steatorrhea
- Intestinal Brush border diseases

Protein losing enteropathy

Nutritional Management in diseases of the liver, Pancreas and Biliary system

Pathophysiology of liver diseases:

Progression of liver disease, Metabolic and nutritional Implications, Role of specific nutrients and alcohol in liver diseases.

Nutritional care in liver disease in the context of results of specific liver function tests. Viral hepatitis, cirrhosis of Liver, Hepatic encephalopathy, Wilsons disease. Liver transplant

Diseases of Gall bladder and pancreas –pathophysiologic changes, Metabolic and Nutritional implications:

- Biliary dyskinesia
- Cholelithiasis
- Cholecystitis
- Cholecystectomy
- Pancreatitis
- Zollinger Ellison syndrome

Nutritional management of metabolic disease 1: Diabetes and hypoglycemia

Prevalence and classification Of DM

- Etiology
- Physiological symptoms and disturbances
- Diagnosis and tests used
- Complications

Management of Diabetes Mellitus

Nutritional therapy

- Diet Plan Food exchange list, Glycemic index, CHO counting.
- Meal planning with and without insulin, during sickness
- Artificial sweeteners and sugar substitutes.
- Drugs and insulin
- Exercise

Hypoglycemia: Classification, symptoms, Fasting hypoglycemia, Postprandial or reactive hypoglycemia, early alimentary and late reactive hypoglycemia, Idiopathic hypoglycemia. Dietary treatment in reactive hypoglycemia.

Nutritional management of metabolic disease: II Gout and inborn error of metabolism Gout:

- Role of proteins and purine

- ❖ Nutritional diagnosis
- ❖ Nutritional Intervention
- ❖ Monitoring and evaluation

Nutritional Intervention – Diet Modification:

- Adequate normal diet as basis for therapeutic diets
- Diet prescription
- Modification of normal diet.
- Nomenclature of diet adequacy in standard hospital diet.
- Psychological factors in feeding the sick person.
- ❖ Interaction among drugs, food nutrients and nutritional status
- ❖ Effects of drugs on food intake nutrient absorption, Metabolism and requirements.
- ❖ Drugs affecting intake of food and nutrients
 - Absorption
 - Metabolism and excretion
 - Nutritional status
- ❖ Effect of food, nutrients and nutritional status on absorption and metabolism of drugs.

Nutritional Management in critical care

- ❖ Nutritional screening and nutritional Status assessment of critically ill.
- ❖ Nutritional requirement according to the critical condition

Nutritional support systems:

Enteral and parenteral nutrition support

Enteral Nutrition

- Site
- Size of the tube
- Feed-types
- Complications

Parenteral Nutrition

- Type
- Composition
- Complications

- ❖ Pre Pregnancy weight and fetal outcome
- ❖ Pre pregnancy height and fetal outcome
- ❖ BMI and other anthropometric measures as applicable
- ❖ Weight gain during pregnancy and fetal outcome.
- ❖ Maternal dietary intake and fetal outcome.
- ❖ Non-nutritional factors: Antenatal care, age, heavy physical work and intra uterine infections.
- ❖ Nutritional assessment and guidance in prenatal care.
- ❖ Nutritional management of high risk pregnancies.

Lactation

- ❖ Physiology
- ❖ Human milk composition and infant growth and development
- ❖ Malnutrition- Effects on milk and effects on mothers.
- ❖ Nutrient requirements during lactation
- ❖ Dietary management
- ❖ Other concern during breast feeding

Infants and preschool children

Growth and development:

- ❖ Physiological changes
- ❖ Growth monitoring
- ❖ Health monitoring
- ❖ Nutrient needs and recommended dietary allowances.
- ❖ Diet and feeding patterns
 - Feeding 0-6 months infant ○
 - Feeding 6-12 months infant ○
 - Feeding preschoolers

Problems of infants and preschoolers nutrition.

Older children and adolescents

- ❖ Changes in physical development and body composition.
- ❖ Sexual maturity
- ❖ Psycho social changes.

Nutrient needs and recommended dietary intakes.

- ❖ Diet and dietary patterns
- ❖ Problems of older children and adolescent nutrition.

Geriatric population

- ❖ Definition of old age
- ❖ Nutrition and ageing
- ❖ Physiological changes associated with ageing.

Changing body composition and techniques for measuring body composition.
Nutritional requirements and dietary modification in the diet of the elderly

Philosophy evolution history of Basic Nutrition

- **Energy yielding food**
- **Body building food**
- **Protective food**

Classification functions, components, Requirements of CARBOHYDRATES

Classification functions, components, Requirements of Proteins

Classification functions, components, Requirements of Lipids

Water:

Introduction, physiological roles, bioavailability, requirements food sources deficiency and toxicity of Minerals

Human Energy Requirements

Energy requirements and dietary energy recommendation.

Food components other than essential nutrients:

Probiotics and Prebiotics

Dietary Factors With Antinutritional Effects.

Food additives and Adulteration

National and international recommendation of nutrient requirements:

4. Glycemic index and factors affecting glycemic index of foods
5. Food additives
6. Standard deviation
7. Hormonal regulation of blood glucose
8. Transport and storage of exogenous lipids

Very short answers

6x2=12 marks

9. Give the reference range for plasma osmolality and list any two conditions where plasma osmolality will be increased.
10. Name any two hormones which are involved in the regulation of fluid and electrolyte balance and explain how they regulate fluid and electrolyte balance with suitable illustration.
11. List the energy source for brain in well fed and fasting condition
12. Mention any TWO inhibitors of HMG coA reductase
13. Mention the biochemical defect in prion's disease with suitable example and illustrations
14. List any FOUR which are nutrition essential aminoacids.

Section B 50 Marks

1. How are endogenous cholesterol transported and metabolized in our body. Add a note on reverse cholesterol transport. (1x10 = 10)

Short Answers

4x7=28marks

2. Calculate BMI for 30 year male with height 159 cm and weight 90 kg and mention any two clinical conditions associated with obesity.
3. What are protective foods? List any two uses of the same.
4. What do you mean by the term food additive? Give suitable examples
5. Potential health benefits of dietary fibre.
6. Enumerate the tests of significance and mention in which situation they will be used
7. Explain the role of vasopressin in water balance
8. Explain the metabolic changes taking place during starvation

Very short answers

2x6=12marks

9. Define SDA and mention its significance
10. Why animal protein is considered superior than plant protein?

PRACTICALS: First Year

1. Characterization and Quantification of carbohydrates, protein and lipids.
2. Determination of saponification number and iodine number from oils
3. Milk analysis physical and chemical(adulteration and contamination)
4. Analysis of food substance
5. Food fortification
6. Problems on calorie requirements
7. Plan and prepare weaning foods.
8. Assessing nutrition status using ABCD parameters.
9. Using different malnutrition assessment tools – SGA, MUST etc.,
10. Planning and preparation of liquid diet.
11. Preparation of formulae for enteral feeding – HOME based combination feeds. supplement feeds.

PRACTICALS: SECOND YEAR

1. Planning enteral feed plan for hypercatabolic condition in adult and pediatric patients.
2. Assessing requirements and planning diet for obese and underweight individual
3. Preparing high fiber low calorie recipes
4. Assessing and planning diets for the following conditions
 - a. IBD – celiac disease
 - b. IBS – Lactose intolerance
5. Plan and prepare diet for those who have fat and protein malabsorption

