Vidyasagar University

Curriculum for B. Sc (General) in Physiology [Choice Based Credit System]

Semester-V

Course	Course Code	Name of the Subjects	Course Type/ Nature	Teaching Scheme in hour per week			Credit	Marks
				L	T	P		
DSE-1A		Any one from Discipline-1(Physiology) **DSE1T:** Sports Physiology, Work Physiology and Ergonomics **Or** Environmental Physiology **Or** Community Nutrition and Public Health **Or** Biostatistics	Core Course	4	0	0	6	75
		DSE1P: Sports Physiology, Work Physiology and Ergonomics(Pr) **Or** Environmental Physiology(Pr) **Or** Community Nutrition and Public Health(Pr) **Or** Biostatistics(Pr)		0	0	4		
DSE-2A	TBD	Other Discipline (Any one from Discipline-2)/TBD	Core Course	5-1-0/4-0-4			6	75
DSE-3A	TBD	Other Discipline (Any one from Discipline-3)/TBD		5-1-0/4-0-4			6	75
SEC-3		**SEC3T:** Maternal and Child Nutrition **Or** Nutrition and Fitness	Skill Enhancement Course-3	1	1	0	2	50
Semester Total							**20**	**275**

L=Lecture, **T**=Tutorial, **P**=Practical, **DSE=** Discipline Specific Electives**, SEC=** Skill Enhancement Course, **TBD** = To be decided.

Discipline Specific Electives (DSE)

DSE-1A: Sports Physiology, Work Physiology and Ergonomics
Or
DSE-1A: Environmental Physiology
Or
DSE-1A: Community Nutrition and Public Health
Or
DSE-1A: Biostatistics

Skill Enhancement Course (SEC)

SEC-3: Maternal and Child Nutrition
Or
SEC-3: Nutrition and Fitness

Semester-V

Discipline Specific Electives (DSE)

DSE -1A: Sports Physiology, Work Physiology and Ergonomics Credits 06

DSE1AT: Sports Physiology, Work Physiology and Ergonomics Credits 04

Course Contents:

Sports & work Physiology: Concepts of Physical work and Physiological work. Physical work: Definition and units of measurement. Classification of Physical work. Classification of workloads. Differences between work and sports. Energetic of muscular works. Measurement of energy cost for various Physical Work. Cardiovascular and respiratory changes during graded exercise. Aerobic and anaerobic capacity. Maximum aerobic power.
Exercise Physiology. Exercise & Performance. Exercise Physiology & Gender. Environmental Exercise Physiology. Maximal oxygen consumption and post exercise oxygen consumption – definition, factors affecting, measurement and significance. Muscle fatigue and recovery. Tests for Physical work capacity – measurement with Bicycle Ergo meter, Tread Mill and Harvard Step Test. Work rest cycle and importance of rest pause.
Physical Training: General Principles and different methods. Effects of overtraining and detraining. Nutrition in sports – neutrient and caloric requirements for different kinds of sports. Sports injury and its management. Sports rehabilitation and sports medicine. Role of sports in emotion and social factors. Basic concepts of sports psychology. Sports Biochemistry. Ergogenic aids. Ergogenic aids & Dietary supplement.

Ergonomic – Basic concepts and its application in industry to improve efficiency. Ergonomics-importance of ergonomics in occupational health and well beings. Physical work environment. Occupational hazards- Physical, Biochemical Hazards. Occupation diseases – Silicosis, Asbestosis, Farmer's Lung. Industrial safety.

Anthropometry: Anthropometry and its implication in general. Different body dimension measures in anthropometry and their significances. Sports Anthropometry.

DSE1AP: Sports Physiology, Work Physiology and Ergonomics (Practical) Credits 02

List of Practical

1. Measurements of resting and working heart rate using thirty beats and ten beats methods respectively.
2. Measurement of blood pressure before and after different graded exercise.

3. Determination of Physical Fitness Index (PFI) of an individual and recording of recovery heart rate after standard exercise.
4. Determine cardiac cost of specific work.
5. Determination of $VO_{2\,max}$ by Queen College step test.
6. Determination of endurance time by hand grip dyanometer.
7. Six minutes walk tests.
8. Measurement of some common anthropometric parameters – stature, weight, eye height(standing), shoulder height, sitting height, knee height (sitting), arm reach from wall, mid – arm circumference, waist circumference, hip circumference, neck circumference, head circumference, chest circumference.
9. Determination of body surface area (using a nomogram) and Body Mass Index (BMI) for an anthropometric measurement.
10. Measurement of body fat percentage.

Or

DSE-1A: Environmental Physiology — Credits 06

DSE1AT: Environmental Physiology — Credits 04

Course contents:

Ecosystem – structure and function, different types of ecosystem, food chains, food webs and energy flow and mineral cycling in ecosystems; primary production and decomposition , Biogeochemical cycle. Global environmental problems: global climate change, ozone layer depletion, the green house effect, global warming and its consequences.

Environment – Physical and biological aspects. Effects of exposure to hot and cold environment. Acclimatization to hot and cold environment. Heat disorders and its preventive measures. Effects of hypobaric and hyperbaric environment. Caisson disease. Mountain sickness. Acclimatization to high altitudes. Preventive measure for hypobaric and hyperbaric effects. Physiological effects and preventive measures against G force, noise, vibration and radiation. Types of pollutants (Primary, secondary and tertiary).

Environmental Pollutions and Health Hazards: Concept of hygiene, health and public health. Air, water, food borne diseases: causes, symptoms and control. Food Additives and Adulterants: definition, examples and human health hazards. Vector Borne Epidemic Diseases: Malaria and Plague- aetiology and control.

Air Pollution: definition, sources, air pollutants, effects of air pollution on human health. Water Pollution: definition, types, health hazards, water pollutants, biochemical oxygen demand (BOD), thermal pollution, concept of safe drinking water standards. Soil Pollution: causes, health hazards, solid waste management, bioremediation, phyto-remediation. Sound Pollution: definition, concept of noise, source of sound pollution, effects of sound pollution on human health, noise index (noise standards). Radionuclide Pollution: ionizing radiations, effects of ionizing radiation on human health, permissible doses. Source, health problems and preventions

of Bio- medical waste. Environment and Health impacts assessment – Concept, Steps and application. Brief idea about biotransformation, bioaccumulation, biomagnifications. Population over growth and its effects on health. Xenobiotics. Impacts of green house effects in life. Human health, permissible doses.

Environmental management: Environmental ethics. Conservation of topsoil, ground water and wild lives; rain water harvesting; sanctuary, national park, biosphere reserve, wildlife (conservation) Act, 1992.

DSE1AP: Environmental Physiology (Practical) **Credits 02**

Practical:

A:

1. Measurement of environmental temperature – dry bulb and wet bulb, relative humidity, air velocity.
2. Determination of O_2,CO_2, BOD & COD
3. Determination of total alkalinity and chlorine in water.
4. Determination of dissolve oxygen in the supplied water samples-supplied water, ground water extracted by shallow and deep tube wells, stream waters, pond water etc.
5. Detection of food additives in different food samples.
6. Biochemical estimation of serum glucose, total proteins, SGPT and SGOT
7. Detection of food additives in different food samples.
8. Determination of light intensity (at library, laboratory, and class room) by lux meter.
9. Determination of sound levels by sound level meter and noise index.

B:

Physiological (experimental) Experiments (Demonstration)

1. Kymographic recording of the effects of Hg, Pb , As compounds and food additives on the movements of perfused heart of toad.

2. Kymographic recordind of the effects of Hg, Pb , As compounds and food additives on the intestinal movements of rats in Dale's bath.

C: Histo - chemical Experiments (Demonstration)

Histochemical studies: chronic effects of food additives and arsenic compounds on liver, kidney, intestine, brain, muscle and lung tissues in rat.

Or

DSE-1A: Community Nutrition and Public Health **Credits 06**

DSE1AT: Community Nutrition and Public Health **Credits 04**

Course contents:

Population, society, community and community health: concepts. Nutrition - introduction. Food as source of nutrients, functions of food, definition of nutrition, Nutrients & energy. Adequate, optimum & good nutrition. Malnutrition and under nutrition, Over nutrition. Human Nutrition- Principle, Interrelationship between nutrition, health& diseases. Visible symptoms of good health. Nutrition - fitness, athletics & sports.

Food guide - Basic food groups. Use of food guide (according to R.D.A.). Use of food in body - digestion, absorption, transport & utilization. ACU- concept.

Balanced diet. Diet Survey – Principles. Composition and nutritional value of common Indian food stuff - rice, wheat, pulses, egg, meat, fish and milk. Dietary fibres - role of fibers in human nutrition. Calorie requirement. Vitamins and Minerals. Malnutrition and under nutrition.
Principles of formulation of balanced diets for growing child, adult man and woman, pregnant and lactating woman. Diet management of obese, diabetic, hypertensive person and athlete. Basic idea on PCM, marasmus, kwashiorkor and their prevention. Iron and Iodine deficiency. Recommended dietary allowances, malnutrition and chronic energy, LBW, PEM, Xerophthalmia, micronutrient disorders. Physiology of starvation and obesity. Food toxicity. Effect of processing on nutritive values of foods.
Socio ecology of nutrition, Habitual diets in India and their adequacy. Nutritional assessment of human and community. Malnutrition in a community. National nutritional related health program.

Epidemiology : Concepts. Public health and public health issues: Basic ideas.Etiology, epidemiology and prevention of malaria, dengue, filarial, hepatitis, AIDS, nutritional anemia, atherosclerotic disorders. Cause and management of thalassemia, gout, obesity, endemic goiter, dental carries.

Population problem – principles and methods of family planning and Assisted Reproductive Technology. Sound pollution as a community health issue; definition, concept of noise, source of extraordinary sound, effects of sound pollution on human health, noise index (noise standards).

DSE1AP: Community Nutrition and Public Health (Practical) Credits 02

Practical:

1. Quantitative estimation of glucose, sucrose by Benedict’s method.
2. Estimation of lactose from milk by Benedict’s methods.
3. Estimation of Chloride by Mohr’s methods.
4. Estimation of amino nitrogen through formol titration methods.

5. Qualitative analysis of pulse, rice, milk to test the presence of carbohydrates, protein, fat.
6. Qualitative identification of lipids and cholesterol.
7. Qualitative assessment of noise by sound level meter.

Field Survey Report:

1. Survey on the status of dietary intake in the surrounding area through visits, etc.

Or

2. Diet survey report of a family (as per ICMR specification). Each student has to submit a report on his/her own family. [Report should be as per ICMR specification. Report should be hand written].
3. A report (hand-written) on the basis of field survey from one of the followings:
   (1) Physiological parameters of human (at least three parameters).
   (2) Anthropometric measurements on human (at least three parameters).

Or

DSE-1A: Biostatistics — Credits 06

DSE1AT: Biostatistics — Credits 04

Course Contents:

Scope of statistics– utility and misuse. Principles of statistical analysis of biological data. Basic concepts –variable. Population and Sampling -- parameter, statistic. Presentation of data frequency distribution, frequency polygon, histogram, bar diagram and pie diagram. Different classes of statistics-mean, median, mode, mean deviation, variance, standard deviation, standard error of the mean, Standard score. Degrees of freedom, Probability. Normal distribution. Student's t- distribution. Testing of hypothesis-Null hypothesis, errors of inference, levels of significance, t- test and z score for significance of difference. Distribution-free test - Chi-square test. Linear correlation and linear regression

DSE1AP: Biostatistics (Practical) — Credits 02

Practical:

1. Computation of mean, median, mode, standard deviation and standard error of the mean with physiological data like body temperature, pulse rate, respiratory rate, height and weight of human subjects.

2. Graphical representation of data in frequency polygon and histogram.

3. Student's t test for significance of difference between means.

4. Demonstration: Statistical analysis and graphical representation of biological data with computer application program (Microsoft Excel).

Skill Enhancement Course (SEC)

SEC- 3: Maternal and Child Nutrition Credits 02

SEC3T: Maternal and Child Nutrition

Course Contents:

Unit - I
• Nutritional needs during pregnancy, common disorders of pregnancy (Anaemia, HIV infection, Pregnancy induced hypertension), relationship between maternal diet and birth outcome.
• Maternal health and nutritional status, maternal mortality and issues relating to maternal health.

Unit - II
• Nutritional needs of nursing mothers and infants, determinants of birth weight and consequences of low birth weight, Breastfeeding biology, Breastfeeding support and counselling

Unit - III
• Infant and young child feeding and care - Current feeding practices and nutritional concerns, guidelines for infant and young child feeding, Breast feeding, weaning and complementary feeding.
• Assessment and management of moderate and severe malnutrition among children, Micronutrient malnutrition among preschool children
• Child health and morbidity, neonatal, infant and child mortality, IMR, U5MR and MMR; link between mortality and malnutrition;

Unit - IV
Overview of maternal and child nutrition policies and programmes.

Or

SEC-3: Nutrition and Fitness Credits 02

SEC3T: Nutrition and Fitness

Course Contents:

Unit -1: Understanding Fitness

- Definition of fitness, health and related terms
- Assessment of fitness
- Approaches for keeping fit

Unit- 2: Importance of nutrition

- Role of nutrition in fitness
- Nutritional guidelines for health and fitness
- Nutritional supplements

Unit -3: Importance of Physical activity

- Importance and benefits of physical activity
- Physical Activity – frequency, intensity, time and type with examples
- Physical Activity Guidelines and physical activity pyramid

Unit - 4: Weight Management

- Assessment, etiology, health complications of overweight and obesity
- Diet and exercise for weight management
- Fad diets
- Principles of planning weight reducing diets

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