FATIMA COLLEGE (AUTONOMOUS), MADURAI-18

RESEARCH CENTRE OF HOME SCIENCE-

HUMAN NUTRITION AND NUTRACEUTICALS

For those who joined in June 2019 onwards

PROGRAMME CODE: PSNN

COURSE CODE	COURSE TITLE	HRS / WK	CREDIT	CIA Mks	ESE Mks	TOT. MKs
SEMESTER - I						
19PG1N1	Advanced Human Nutrition	6	4	40	60	100
19PG1N2	Advanced Dietetics	6	4	40	60	100
19PG1N3	Applied Physiology	6	4	40	60	100
19PG1N4	Advanced Dietetics Lab	4	2	40	60	100
19PG1N5	Clinical Laboratory Techniques Lab	4	2	40	60	100
19PGNEDC1	EDC-Nutrition & Dietetics	3	3	40	60	100
	Library	1	-	-	-	-
Total		**30**	**19**			
SEMESTER - II						
19PG2N6	Clinical Nutrition & Diet Therapy	6	4	40	60	100
19PG2N7	Functional Foods & Nutraceuticals	6	4	40	60	100
19PG2N8	Research Methodology	6	4	40	60	100
19PG2N9	Clinical Nutrition & Diet Therapy Lab	4	2	40	60	100
19PG2N10	Functional Foods & Nutraceuticals Lab	4	2	40	60	100
19PGNEDC2	EDC-Nutrition & Dietetics	3	3	40	60	100
	Library	1		-	-	-

Total		**30**	**19**			
SEMESTER - III						
19PG3SIN1	Summer Internship	-	3	50	50	100
19PG3N11	Functional Foods & Nutraceuticals in Preventive Dietetics	6	5	40	60	100
19PG3N12	Community Nutrition	6	5	40	60	100
19PG3N13	Analytical Instrumentation	6	5	40	60	100
19PG3NE1/ 19PG3NE2	Food Product Development and Evaluation/ Institutional Management	4	4	40	60	100
19PG3N14	Community Nutrition Lab	4	2	40	60	100
19PG3N15	Techniques for Experimental Nutrition Lab	4	2	40	60	100
Total		**30**	**26**			
SEMESTER - IV						
19PG4N16	Food Microbiology	6	5	40	60	100
19PG4N17	Nutritional Biochemistry	6	5	40	60	100
19PG4N18	Advanced Food Science and Processing Techniques	6	5	40	60	100
19PG4NE3/ 19PG4NE4	Food Safety and Quality Control/ Nutrition in Critical Care and Disasters	4	4	40	60	100
19PG4N19	Food Microbiology Lab	4	2	40	60	100
19PG4N20	Nutrient Analysis Lab	4	2	40	60	100
19PG4N21	Project*& Viva Voce		3	50	50	100
Total		**30**	**26**			
	Total	**120**	**90**			

OFF-CLASS PROGRAMME

ADD-ON COURSES

Course Code	Courses	Hrs.	Credits	Semester in which the course is offered	CIA Mks	ESE Mks	Total Marks
	SOFT SKILLS	40	4	I	40	60	100
	COMPUTER APPLICATIONS SPSS	40	4	II	40	60	100
	MOOC COURSES (Department Specific Courses/any other courses) * Students can opt other than the listed course from UGC-SWAYAM /UGC /CEC	-	Minimum 2 Credits	-	-	-	
	COMPREHENSIVE VIVA (Question bank to be prepared for all the papers by the respective course teachers)	-	2	IV	-	-	100
	READING CULTURE	15/ Semester	1	I-IV	-	-	-
	TOTAL		13 +				

EXTRA CREDIT COURSE

Course Code	Courses	Hrs.	Credits	Semester in which the course is offered	CIA Mks	ESE Mks	Total Marks
19PGSLN1	**SELF LEARNING COURSE for ADVANCED LEARNERS (Offered for II PG)**	-	-	III & IV	40	60	100

- **Lab Courses :**
  - A range of 10-15 experiments per semester

- **Summer Internship:**
  - Duration-1 month (2nd Week of May to 2nd week of June-before college reopens)

- **Project:**
  - Off class
  - Evaluation components-Report writing + Viva Voce (Internal marks-50) + External marks 50

- **EDC:**

  Syllabus should be offered for two different batches of students from other than the parent department in Sem-I & Sem-II

OLD

I M.Sc.,HUMAN NUTRITION AND NUTRACEUTICALS

SEMESTER –I

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSNN	19PG1N3	Applied Physiology	Major Core	6	4

COURSE DESCRIPTION

The course provides a detailed insight on the anatomy and functions of the various systems of the human body.

COURSE OBJECTIVES

- Organs of the body and their functions
- Different systems of the body, their functions with special reference to the control and feedback mechanisms
- Physiological changes at different stages of life.

UNITS

UNIT –I BLOOD AND ENDOCRINE SYSTEM (18 HRS.)

Blood

Composition and functions of blood and Plasma proteins,RBC – Structure and functions, Bone marrow – functions, Erythropoiesis, Haemoglobin, Life span ,fate, Anaemia, haemolysis, polycythemia, ESR, WBC – Classification and functions, Coagulation, Bleeding time, clotting time.Blood Groups.Blood indices,Use of blood for investigation and diagnosis of specific disorders.

Endocrine system

Structure, functions,role of hormones,regulation of hormonal secretion and disorders of pituitary gland, thryroid gland, parathyroid gland, pancreas and adrenal glands. Emphasis on physiology of Diabetes and stress hormones.

UNIT –II CIRCULATORY SYSTEM (18 HRS.)

Anatomical considerations of heart, valves of heart and its action, layers of heart, blood vessels – arteries, arterioles, capillaries, veins, vasa vasorum.Blood pressure – factors and regulation.

Cardiac centre – heart rate – regulation, cardiac output, cardiac impulse, junctional tissues, cardiac cycle, heart sounds, ECG, coronary circulation, pulmonary circulation, cerebral circulation, hepatic circulation, renal circulation, cutaneous circulation and skeletal muscle circulation.

UNIT –III DIGESTIVE AND EXCRETORY SYSTEM (18 HRS.)

Digestive system

Review of anatomy and functions- secretary, digestive and absorptive functions of the digestive tract – Buccal cavity, stomach, pancreas, liver, small intestine and large intestine. Role of enzymes and hormones in digestion and absorption of carbohydrate, protein and fat. Dysfunction of liver,pancreas and gallbladder.

Excretory system

Anatomy and functions of kidney and nephrons, juxta glomerular apparatus. Formation of urine, micturition. Role of kidney in maintaining pH of blood. Water, electrolyte and acid base balance, diuretics.

UNIT –IV MUSCULO –SKELETAL AND RESPIRATORY SYSTEM (18 HRS.)

Musculo -Skeletal system

Structure and function of Bone tissue – osteocytes, osteoblasts, osteoclasts, structure of osseous tissue, section of femur bone. Types of muscles – structure and functions.

Respiratory system

Review of structure and functions of the respiratory tract, lung unit.Mechanism of respiration, transport of oxygen and carbon dioxide. Regulation of respiration, lung volumes, pulmonary function tests, Cardio – respiratory response to exercise and physiological effects of training.

UNIT –V NERVOUS SYSTEM AND REPRODUCTIVE SYSTEM (18 HRS.)

Nervous System

Review of structure and function of nervous system –central or somatic nervous system - neuron –types, structure, properties, myelin sheath, nerve endings, synapse, neurotransmitters, reflex arc, receptors, brain –cerebrum-cerebral cortex-cerebral lobes-structure and functions, cerebellum, medulla oblongata, - thalamus, hypothalamus. The role of Hypothalamus in various body functions – obesity, sleep, memory. Autonomic nervous system –

sympathetic and parasympathetic – actions, functions of ANS. Blood Brain Barrier, CSF

Reproductive System

Primary and accessory sex organs, secondary sexual characteristics of male, female and transgender, Menstrual cycle, menopause and post menopausal changes.

REFERENCES:

1. Best and Taylor, The Living Body, Chapman and Hall ltd., London.
2. Chatterji (1999).*Human Physiology*, Roy Publications
3. Gitanjali Chatterjee (1999) *Handbook of Food and Nutrition*, Rajat Publications.
4. Guyton, A.C& Hall J.B (1996):*Textbook of Medical Physiology*,9th edition W.B Sanders Company, Prism Books (Pvt) Ltd,Bangalore.
5. Kamala Krishnaswami (2000) *Nutrition Research-Current Scenerio and future trends,* Oxford and IBH Publishing Co.Pvt.ltd.,
6. Lraine M.Summerfield (2000).*Nutrition ,exercise and behaviour an integrated approach to Weight management* ,Thomson learning,
7. Mahtab S. Bamji, Pralhad & Rao Vinodhini Reddy.(1996) *Textbook of Human Nutrition,* Oxford, IBH publishing Co. pvt ltd.,
8. Margaret McWilliams (1994).*Experimental Food laboratory Manual*,Surjeet Publications,
9. Mickael J.Gibney,Ian A.Macdonald & Helen M.Roche (2004),*Nutrition and metabolism* Blackwell Publications,.
10. Mike Epsy (2001) *Nutrition Eating for good health*,Surbhi Publications,Jaipur,.
11. Sembulingam & Prema Sembulingam (2006), *Essentials of Medical Physiology*, Yaypee Brothers, Medical Publishers (p) Ltd, New Delhi.
12. Vijay Kamshik (2000).*Food science and nutrition,* Mangal Deep Publications. Jaipur

JOURNAL REFERENCES:

1. Journal of Applied Physiology
2. Journal of General Physiology
3. BMC Physiology
4. Physiological Reviews
5. International Journal of Basic & Applied Physiology

Open Educational Resources:

1. https://scholar.google.co.in/scholar
2. https://journals.physiology.org/doi/full/10.1152/japplphysiol.00711.2011
3. https://www.springer.com/journal/421

4. https://opentextbooks.concordia.ca/oerbydiscipline/chapter/kinesiology-2/

5. https://publons.com/journal/39067/european-journal-of-applied-physiology-and-occupat/

6. https://openstax.org/details/books/anatomy-and-physiology

NEW

I M.Sc., HUMAN NUTRITION AND NUTRACEUTICALS

SEMESTER –I 10 %

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSNN	19PG1N3	Applied Physiology	Major Core	6	4

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UNITS

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Endocrine system

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Reproductive System 10 %

Primary and accessory sex organs, secondary sexual characteristics of male, female and transgender, Menstrual cycle, menopause and post menopausal changes.

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13. Best and Taylor, The Living Body, Chapman and Hall ltd., London.
14. Chatterji (1999).*Human Physiology*, Roy Publications
15. Gitanjali Chatterjee (1999) *Handbook of Food and Nutrition*, Rajat Publications.
16. Guyton, A.C& Hall J.B (1996):*Textbook of Medical Physiology*,9th edition W.B Sanders Company, Prism Books (Pvt) Ltd,Bangalore.
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20. Margaret McWilliams (1994).*Experimental Food laboratory Manual*,Surjeet Publications,
21. Mickael J.Gibney,Ian A.Macdonald & Helen M.Roche (2004),*Nutrition and metabolism* Blackwell Publications,.
22. Mike Epsy (2001) *Nutrition Eating for good health*,Surbhi Publications,Jaipur,.
23. Sembulingam & Prema Sembulingam (2006), *Essentials of Medical Physiology*, Yaypee Brothers, Medical Publishers (p) Ltd, New Delhi.
24. Vijay Kamshik (2000).*Food science and nutrition,* Mangal Deep Publications. Jaipur

JOURNAL REFERENCES:

6. Journal of Applied Physiology
7. Journal of General Physiology
8. BMC Physiology
9. Physiological Reviews
10. International Journal of Basic & Applied Physiology

Open Educational Resources:

7. https://scholar.google.co.in/scholar
8. https://journals.physiology.org/doi/full/10.1152/japplphysiol.00711.2011
9. https://www.springer.com/journal/421
10. https://opentextbooks.concordia.ca/oerbydiscipline/chapter/kinesiology-2/
11. https://publons.com/journal/39067/european-journal-of-applied-physiology-and-occupat/
12. https://openstax.org/details/books/anatomy-and-physiology

OLD

II M.Sc., HUMAN NUTRITION AND NUTRACEUTICALS

SEMESTER –III

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
PSNN	19 PG3N13	Analytical Instrumentation	Major Core	6	5

COURSE DESCRIPTION

The course offers the understanding of the principles, instrumentation and analytical techniques of food

COURSE OBJECTIVES

- To understand the principle and instrumentation of hi-tech analytical techniques.
- To gain knowledge on applications of different analytical instruments.

UNITS

UNIT –I CHROMATOGRAPHY (18HRS.)

Meaning – Types of Chromatography – principles, components and applications of

i. Paper Chromatography – Ascending and descending – One and two dimensional
ii. Thin Layer Chromatography
iii. Gas Chromatography
iv. Ion exchange
v. Gel filtration
vi. High Performance Liquid Chromatography

UNIT –II ELECTROPHORESIS (18 HRS.)

Meaning –Types –Paper, Starch, Gel, Agar-gel, Poly Acrylamide gel, Moving boundary Electrophoresis, Immuno electrophoresis – Principle – components – Applications.

UNIT –III COLORIMETRY, FLUORIMETRY AND CENTRIFUGATION (18 HRS.)

Photoelectric Colorimeters, Fluorimeters –Principle -Applications.

CENTRIFUGATION:

Types of Centrifuge – Ordinary and Ultracentrifuge - Principle and applications.

MICROBIOLOGICAL ASSAYS

Types of Assays -Principle - Requirements for the conduct of Microbiological assays –Applications.

UNIT –IV SPECTROSCOPY (18 HRS.)

SPECTROSCOPY:

Spectrophotometry – Spectrophotometers – Atomic Absorption Spectrophotometry

Spectrophotometers –Principle – Applications.

NMR and NIR:

Nuclear Magnetic Resonance- Application and principle

Near Infra Red -Principle and Application

UNIT –V ISOTOPES (18 HRS.)

Types – Stable and Radioactive, Units of radio-activity – Uses in biological investigations - Geiger Muller Counter and Scintillation Counter –Effects of ionizing radiation-hazards and prevention - Applications.

pH and Buffer:

pH meter –measurement of pH, Buffer – Definition – Types – Buffer system with special reference to living body

REFERENCES:

1. Ewing. W.W. (1970). *Instrumental Methods of Chemical Analysis.* McGraw Hill Book Company, New Delhi.

2. Mahinder Singh, (2003). *Analytical Chemistry – Instrumental Techniques.* Dominant Publishers and Distributors, New Delhi.

3. Nikelal, (1973). *Experimental methods in Biophysical Chemistry*. John Wiley Publishers.

4. Yadav M.S (2001). *Instrumental Methods of Chemical Analysis*. Campus Books Internationals, New Delhi.

Open Educational Resources:

1.https://microbenotes.com/types-of-chromatography/

2.https://www.slideshare.net/BlueRose9/electrophoresis-78994484

3.https://study.com/academy/lesson/spectrophotometer-definition-uses-parts.html

4.https://www.thermofisher.com/in/en/home/industrial/spectroscopy-elemental-isotope-analysis/spectroscopy-elemental-isotope-analysis-learning-center/molecular-spectroscopy-information/nmr-information/nmr-applications-process-control.html

5.https://dlc.dcccd.edu/biology1-2/ph-and-buffers

6.https://www.onlinebiologynotes.com/fluorimetry-principle-and-applications/

NEW

II M.Sc., HUMAN NUTRITION AND NUTRACEUTICALS

SEMESTER –III 5%

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
PSNN	19 PG3N13	Analytical Instrumentation	Major Core	6	5

COURSE DESCRIPTION

The course offers the understanding of the principles, instrumentation and analytical techniques of food

COURSE OBJECTIVES

- To understand the principle and instrumentation of hi-tech analytical techniques.
- To gain knowledge on applications of different analytical instruments.

UNITS

UNIT –I CHROMATOGRAPHY (18HRS.)

Meaning – Types of Chromatography – principles, components and applications of

vii. Paper Chromatography – Ascending and descending – One and two dimensional
viii. Thin Layer Chromatography
ix. Gas Chromatography
x. Ion exchange
xi. Gel filtration
xii. High Performance Liquid Chromatography

UNIT –II ELECTROPHORESIS (18 HRS.)

Meaning –Types –Paper, Starch, Gel, Agar-gel, Poly Acrylamide gel, Moving boundary Electrophoresis, Immuno electrophoresis – Principle – components – Applications.

UNIT –III COLORIMETRY, FLUORIMETRY AND CENTRIFUGATION (18 HRS.)

Photoelectric Colorimeters, Fluorimeters –Principle -Applications.

CENTRIFUGATION:

Types of Centrifuge – Ordinary and Ultracentrifuge - Principle and applications.

MICROBIOLOGICAL ASSAYS

Types of Assays -Principle - Requirements for the conduct of Microbiological assays –Applications.

UNIT –IV SPECTROSCOPY (18 HRS.)

SPECTROSCOPY: 5%

Spectrophotometry – Spectrophotometers – Atomic Absorption Spectrophotometry & ICP.

Spectrophotometers –Principle – Applications.

NMR and NIR:

Nuclear Magnetic Resonance- Application and principle

Near Infra Red -Principle and Application

UNIT –V ISOTOPES (18 HRS.)

Types – Stable and Radioactive, Units of radio-activity – Uses in biological investigations - Geiger Muller Counter and Scintillation Counter –Effects of ionizing radiation-hazards and prevention - Applications.

pH and Buffer:

pH meter –measurement of pH, Buffer – Definition – Types – Buffer system with special reference to living body

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3.https://study.com/academy/lesson/spectrophotometer-definition-uses-parts.html

4.https://www.thermofisher.com/in/en/home/industrial/spectroscopy-elemental-isotope-analysis/spectroscopy-elemental-isotope-analysis-learning-center/molecular-spectroscopy-information/nmr-information/nmr-applications-process-control.html

5.https://dlc.dcccd.edu/biology1-2/ph-and-buffers

6.https://www.onlinebiologynotes.com/fluorimetry-principle-and-applications/