Resolution No. AC/II(22-23).3.RUS2

S. P. Mandali's

Ramnarain Ruia Autonomous College

(Affiliated to University of Mumbai)

RUIA COLLEGE
Explore • Experience • Excel

Syllabus for

Program: F.Y.B.Sc.

Program Code: RUSBCH

(As per the guidelines of National Education Policy 2020-
Academic year 2023-24)

(Choice Based Credit System)

GRADUATE ATTRIBUTES

S.P. Mandali's Ramnrain Ruia Autonomous College has adopted the Outcome Based Education model to make its science graduates globally competent and capable of advancing in their careers. The Bachelor's Program in Science also encourages students to reflect on the broader purpose of their education.

GA	GA Description **A student completing Bachelor's Degree in SCIENCE program will be able to:**
GA 1	**Recall and explain acquired scientific knowledge in a comprehensive manner and apply the skills acquired in their chosen discipline. Interpret scientific ideas and relate its interconnectedness to various fields in science.**
GA 2	**Evaluate scientific ideas critically, analyse problems, explore options for practical demonstrations, illustrate work plans and execute them, organise data and draw inferences.**
GA 3	**Explore and evaluate digital information and use it for knowledge upgradation. Apply relevant information so gathered for analysis and communication using appropriate digital tools.**
GA 4	**Ask relevant questions, understand scientific relevance, hypothesize a scientific problem, construct and execute a project plan and analyse results.**
GA 5	**Take complex challenges, work responsibly and independently, as well as in cohesion with a team for completion of a task. Communicate effectively, convincingly and in an articulate manner.**
GA 6	**Apply scientific information with sensitivity to values of different cultural groups. Disseminate scientific knowledge effectively for upliftment of the society.**

GA 7	**Follow ethical practices at workplace and be unbiased and critical in interpretation of scientific data. Understand the environmental issues and explore sustainable solutions for it.**
GA 8	**Keep abreast with current scientific developments in the specific discipline and adapt to technological advancements for better application of scientific knowledge as a lifelong learner**

PROGRAM OUTCOMES

PO	Description A student completing Bachelor's Degree in SCIENCE program in the subject of BIOCHEMISTRY will be able to:
PO 1	Achieve better understanding of the major thrust areas of the disciplines like Chemistry of Biomolecules & their metabolism, Cell biology (Basics, Membrane biochemistry, Cancer), Enzymology, Genetics, Plant Biochemistry, Pharmacology, Microbiology & Immunology.
PO 2	Gain acumen of the fundamental biochemical processes occurring at the molecular and gene level.
PO 3	Understand the role of Biochemistry in food and human nutrition
PO 4	Get insights into multiple important analytical tools for Biochemical testing and apply contextual knowledge and tools of biochemical research for problems solving.
PO 5	Acquire and empower technical knowledge by connecting disciplinary and interdisciplinary aspects of biochemistry.
PO 6	Compile and interpret Biological data using Biostatistics and Bioinformatics tools.
PO 7	Express ideas persuasively through scientific writing and oral presentation which will help in the development of the leadership qualities.
PO 8	Possess scientific temperament by research project-based learning.
PO 9	Procure hands-on real time experience in industries.
PO 10	Get exposure to the strong theoretical and practical understanding of various dimensions of Biochemistry and take up research-oriented courses in the fields of Biochemistry, Nutrition & Dietetics, Molecular Biology, etc.

CREDIT STRUCTURE BSc

Semester	Subject 1		Subject 2	GE/ OE course (Across disciplines)	Vocational and Skill Enhancement Course (VSC) & SEC	Ability Enhancement Course/ VEC/IKS	OJT/FP/CEPCC, RP	Total Credits
	DSC	DSE						
1	4		4	4 (2*2)	VSC-2 + SEC -2	AEC- 2 (CSK) + VEC- 2 (Env Sc.) + IKS-2		22
2	4		4	4 (2*2)	VSC-2 + SEC-2	AEC-2 (CSK)+ VEC-2 (Understanding India)	CC-2	22
Total	8		8	8	8	10	2	44
Exit option: award of UG certificate in Major with 44 credits and an additional 4 credit Core NSQF course/ Internship or Continue with Major and Minor								
3	Major 8		Minor 4	2	VSC-2	AEC-2 MIL	FP -2, CC-2	22
4	Major 8		Minor 4	2	SEC-2	AEC-2 MIL	CEP-2, CC-2	22
Total	16		8	4	4	4	8	44
Exit option: award of UG Diploma in Major with 88 credits and an additional 4 credit Core NSQF course/ Internship or Continue with Major and Minor								
5	DSC 12	DSE 4	Minor 2		VSC-2		CEP/FP-2	22
6	DSC 12	DSE 4	Minor 2				OJT-4	22
Total	24	8	4		2		6	44
	Exit option: award of UG Degree in Major with 132 credits or Continue with Major for Honours/ Research							

Semester II

Course Code: RUSSECBCH.O101

Course Title: Nutrition & Anthropometric Techniques

Type of course: Skill Enhancement Course (SEC)

Academic year 2023-24

COURSE OUTCOMES:

COURSE OUTCOME	DESCRIPTION A student completing this course will be able to:
CO 1	Explain the various macro and micronutrients and their classification.
CO 2	Relation of diet and nutrition on biochemical functions of the human body and how these have regulatory roles in metabolism
CO 3	Summarize the role of nutrients in the optimal functioning of biochemical pathways in the body.
CO 4	Examine the physiological and metabolic functions of nutrients
CO 5	List the importance of food and meaning of nutrition and familiarize them with RDA and Recommendations & Guidelines
CO6	Identify anthropometric indicators of the nutritional status for children, adults and geriatric age group
CO7	Interpretation of scientific facts on the relationship between nutrition, health and fitness and gain knowledge on nutrition standards and guidelines.
CO8	Make use of theoretical concepts of Nutrition & Anthropometric Techniques in Biochemistry and develop experimental acumen

DETAILED SYLLABUS

Course Code	Unit	Course/ Unit Title Nutrition & Anthropometric Techniques RUSSECBCH.O101	Credits/ Hours 1 / 15 Hours
I	**1**	**Introduction to Nutrition**	**15**
	1.1.1	Introduction to Human nutrition & energy supply	
	1.1.2	Measurement of energy content of food- Calorific value of different biomolecules & mixed diet, Determination of calorific value using bomb Calorimeter (Principle & Working)	
	1.2	Respiratory quotient of food	
	1.3	Measurement of energy expenditure Basal metabolic rate- Definition, Measurement, factors affecting BMR & its significance	
	1.4	Specific dynamic action of food- Definition, Mechanism & its significance	
	1.5	Sources, Daily requirement & Nutritional importance of biomolecules	
	1.5.1	Carbohydrates- Concept of Glycemic Index of food (Graph), Importance of fiber (Complex carbohydrate) in nutrition	
	1.5.2	Lipids-Role of essential fatty acids	
	1.5.3	Proteins- Essential amino acids, Nitrogen Balance (Positive, Negative Nitrogen balance & factors affecting)	
	1.6	Assessment of nutritive value of protein	
	1.6.1	Protein efficiency ratio	
	1.6.2	Biological value of protein	
	1.6.3	Net protein utilization	
	1.6.4	Chemical score	
	1.6.5	Mutual supplementation of protein	
	1.7	Recommended Dietary allowances (RDA)- Definition, Factors affecting RDA, RDA for adult	
	1.8	Macroelements and Microelements	
	1.9	Numericals based on above concepts	

Practical

Sr. No	Course code- RUSSECBCHP.O101 Practical Title- Practicals based on RUSSECBCH.O101	1 Credit
1	Anthropometric measurements	
2	Estimation of Glucose by DNSA method	
3	Isolation of starch	
4	Isoelectric precipitation of casein	
5	Estimation of Proteins by Biuret method	
6	Isolation & estimation of whey proteins	
7	Lipid extraction by cold percolation method	

References:

1. Principles of Nutritional Assessment (2005) Rosalind Gibson. Oxford University Press.
2. Nutritional Biochemistry: Tom Brody.
3. Textbook of medical laboratory technology: Dr. Praful Godkar, Bhalani Publishing House
4. Biochemical methods by S Sadashivam & A Minackam, New Age International publisher.
5. Introduction to Human nutrition, second edition, Edited on behalf of The Nutrition Society by Michael J Gibney, Susan A Lanham-New, Aedin Cassidy, Hester H Vorster Wiley Blackwell Publications

Modality of Assessment: Skill Enhancement Course (SEC) (2 Credit Theory Course for BSc)

A) Internal Assessment- 40%- 30 Marks

Sr No	Evaluation type	Marks
1	Class test	20
	TOTAL	**20**

B) External Examination- (Semester End) 60%- 30 Marks

Semester End Theory Examination:

1. Duration - These examinations shall be of **One hour** duration.
2. Theory question paper pattern:

Paper Pattern:

Question	Options	Marks	Questions Based on
Q1.	Any 4 out of 6	20	UNIT I
Q2.	Any 5 out of 7	10	UNIT I
	TOTAL	**30**	

Practical Examination Pattern: Total Marks 25

Particulars	Marks
Laboratory Work	25
Viva & Journal	05
Total	30