

Scheme of Examination and Syllabus

For

Bachelor of Science (B.Sc.)

Value Added Courses

Semester I to VI (2025-2028)



RAFFLES
UNIVERSITY

SCHOOL OF BASIC AND APPLIED SCIENCES (SOBAS)

RAFFLES UNIVERSITY

**Japanese Zone, National Highway-48, Neemrana-301705, District: Alwar, RAJASTHAN,
INDIA www.rafflesuniversity.edu.in**



SCHOOL OF BASIC AND APPLIED SCIENCES

(Syllabus and Scheme of Studies for the session 2025-28)

B. Sc. I Year (I Semester)

Examination Time: 3 Hrs

Maximum Marks: 50

Paper Title: Physical Education-Yoga

Paper Code: BSC-VAC1

Schedule per week Lectures: 2

Note: Examiner will set questions from the syllabus and the students will be required to attempt questions as per instructions provided in each note/section of the paper.

UNIT I

Introduction to Yoga

- Definition, origin, and history of Yoga.
- Streams and schools of Yoga.
- Relevance of Yoga in modern life.

UNIT II

Principles of Yogic Practice

- Role of Yama and Niyama.
- Concept of Ashtanga Yoga (Patanjali).
- Health benefits of Yoga.

UNIT III

Asanas

- Standing, sitting, prone, and supine postures.
- Demonstration and practice of basic asanas (e.g., Tadasana, Bhujangasana, Padmasana, Shavasana).

UNIT IV

Pranayama and Meditation

- Breathing techniques: Anulom Vilom, Kapalabhati, Bhastrika.
- Basic meditation methods.

UNIT V

Yoga for Lifestyle Disorders

- Yoga for stress management.
- Yoga for obesity, diabetes, hypertension.

Suggested Readings

1. Iyengar, B.K.S. *Light on Yoga*. HarperCollins.
2. Swami Satyananda Saraswati. *Asana Pranayama Mudra Bandha*. Bihar School of Yoga.
3. Ministry of AYUSH. *Common Yoga Protocol*.



SCHOOL OF BASIC AND APPLIED SCIENCES

(Syllabus and Scheme of Studies for the session 2025-28)

B. Sc. I Year (II Semester)

Examination Time: 3 Hrs

Maximum Marks: 75 (25+50)

Paper Title: Environmental Studies

Paper Code: BSC-VAC2

Schedule per week Lectures: 2

Note: Examiner will set questions from the syllabus and the students will be required to attempt questions as per instructions provided in each note/section of the paper.

UNIT I

Introduction to Environment

- Components of environment.
- Ecology and ecosystems.

UNIT II

Environmental Pollution

- Air, water, soil, and noise pollution: sources, effects, and control.

UNIT III

Natural Resources

- Renewable and non-renewable resources.
- Biodiversity and its conservation.

UNIT IV

Climate Change and Sustainability

- Global warming, ozone depletion.
- Sustainable development goals (SDGs).

UNIT V

Environmental Laws and Policies

- Environmental Protection Act.
- Wildlife Protection Act.
- Role of individuals in environmental protection.

Suggested Readings

1. Kaushik, A. and Kaushik, C.P. *Environmental Science*. New Age International.
2. Miller, G.T. *Living in the Environment*. Brooks/Cole.
3. Bharucha, E. *Textbook of Environmental Studies for Undergraduate Courses*. UGC.



SCHOOL OF BASIC AND APPLIED SCIENCES

(Syllabus and Scheme of Studies for the session 2025-28)

B. Sc. I Year (II Semester)

Examination Time: 3 Hrs

Maximum Marks: 75 (25+50)

Paper Title: NCC/NSS/Cultural

Paper Code: BSC-VAC3

Schedule per week Lectures: 2

Note: Examiner will set questions from the syllabus and the students will be required to attempt questions as per instructions provided in each note/section of the paper.

UNIT I

Introduction to NCC / NSS

- Aims, objectives, and motto.
- Structure and organization.

UNIT II

Leadership and Personality Development

- Discipline, teamwork, and communication.

UNIT III

Community Service

- Social welfare activities.
- Disaster management and relief.

UNIT IV

Cultural Awareness

- Indian cultural heritage.
- Folk and classical art forms.

UNIT V

Field Activities

- Parade drills / cultural event organization.
- Community clean-up campaigns.

Suggested Readings

1. NSS Programme Officer Manual, Ministry of Youth Affairs & Sports.
2. NCC Training Directorate. *Cadet's Handbook*.
3. Ministry of Culture publications on Indian heritage.



SCHOOL OF BASIC AND APPLIED SCIENCES

(Syllabus and Scheme of Studies for the session 2025-28)

B. Sc. III Year (V Semester)

Examination Time: 3 Hrs

Maximum Marks: 50 (25+25)

Paper Title: Human Values-I

Paper Code: BSC-VAC4

Schedule per week Lectures: 1

Note: Examiner will set questions from the syllabus and the students will be required to attempt questions as per instructions provided in each note/section of the paper.

UNIT I

Introduction to Human Values

- Definition, types, and importance.

UNIT II

Harmony in the Individual

- Self-awareness, self-esteem, and self-confidence.

UNIT III

Harmony in Family and Society

- Respect, trust, and empathy.
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UNIT IV

Professional Ethics

- Integrity, responsibility, and accountability.

UNIT V

Case Studies on Values

- Stories of ethical leadership.

Suggested Readings

1. R. R. Gaur, R. Sangal, G. P. Bagaria. *A Foundation Course in Human Values and Professional Ethics*. Excel Books.
2. UNESCO. *Learning to Live Together*.



SCHOOL OF BASIC AND APPLIED SCIENCES

(Syllabus and Scheme of Studies for the session 2025-28)

B. Sc. III Year (VI Semester)

Examination Time: 3 Hrs

Maximum Marks: 25

Paper Title: Human Values-II

Paper Code: BSC-VAC5

Schedule per week Lectures: 1

Note: Examiner will set questions from the syllabus and the students will be required to attempt questions as per instructions provided in each note/section of the paper.

UNIT I

Values and Sustainable Development

- Role of values in achieving SDGs.

UNIT II

Human Rights and Responsibilities

- Equality, justice, and freedom.

UNIT III

Conflict Resolution

- Negotiation, mediation, and dialogue.

UNIT IV

Values in Governance

- Transparency and accountability.

UNIT V

Global Perspectives on Values

- Intercultural ethics and world peace.

Suggested Readings

1. Chakraborty, S.K. *Foundations of Managerial Work: Contributions from Indian Thought*.
2. Amartya Sen. *The Idea of Justice*. Penguin Books.



SCHOOL OF BASIC AND APPLIED SCIENCES

(Syllabus and Scheme of Studies for the session 2025-28)

B. Sc. III Year (VI Semester)

Examination Time: -

Maximum Marks: 50

Paper Title: Internship

Paper Code: BSC-VAC6

Schedule per week Lectures: 2

Note: Students may select any of the internship programs as per the requirement of the course. In addition, student may opt programs other than the list of programs mentioned as per the availability of time and place.

Zoology

- **Wildlife Research & Conservation Internships** – Wildlife Institute of India (Dehradun), WWF-India.
- **Fisheries & Aquaculture** – Central Institute of Fisheries Education (Mumbai), ICAR institutes.
- **Entomology & Pest Management** – Agricultural universities & ICAR-Indian Institute of Horticultural Research.
- **Zoological Parks & Museums** – National Zoological Park (Delhi), State Natural History Museums.
- **Veterinary & Animal Husbandry Support** – Veterinary colleges, animal shelters (PETA India, People for Animals).

Botany

- **Plant Tissue Culture & Biotechnology** – National Botanical Research Institute (Lucknow), university labs.
- **Herbarium & Plant Taxonomy** – Botanical Survey of India.
- **Forest Ecology & Biodiversity Monitoring** – State Forest Departments, NGO projects.
- **Medicinal Plants Research** – Central Institute of Medicinal and Aromatic Plants (CIMAP, Lucknow).
- **Agricultural Research** – ICAR institutes, Krishi Vigyan Kendras.

Physics

- **Materials Science Research** – Bhabha Atomic Research Centre (BARC), TIFR.
- **Astronomy & Astrophysics** – Indian Institute of Astrophysics (Bengaluru), IUCAA (Pune).
- **Renewable Energy Systems** – National Institute of Solar Energy, wind energy companies.
- **Nanotechnology Labs** – CSIR-National Physical Laboratory (Delhi).
- **Electronics & Instrumentation** – DRDO labs, ISRO internships.

Chemistry

- **Pharmaceutical Analysis** – Ranbaxy, Cipla, Sun Pharma internship programs.
- **Food & Water Quality Testing** – FSSAI-approved labs, BIS.
- **Chemical R&D** – CSIR-Central Drug Research Institute (CDRI, Lucknow).
- **Environmental Analysis** – CPCB/SPCB labs for soil, water, and air analysis.
- **Polymer & Material Chemistry** – National Chemical Laboratory (NCL, Pune).

Mathematics

- **Statistical Data Analysis** – ISI (Indian Statistical Institute), government census projects.
- **Financial Modeling & Risk Analysis** – Banking and insurance companies.
- **Operations Research Projects** – Supply chain/logistics companies.
- **Mathematical Modeling in Research** – DRDO, CSIR research projects.
- **Data Analytics Internships** – NITI Aayog, private analytics firms.

Computer Science

- **Software Development** – IT companies (Infosys, Wipro, TCS internship programs).
- **Machine Learning & AI Projects** – Startups, research labs like C-DAC.
- **Cybersecurity** – CERT-In, private cyber audit firms.
- **Web & App Development** – Freelance or startup projects.
- **Bioinformatics** – Collaboration with biology departments for genome analysis.

Opportunities:

- **Government Portals:** Internship.gov.in, AICTE Internship Portal
- **Research Institutions:** CSIR, ICAR, ISRO, DRDO, ICMR.
- **NGOs:** WWF, TERI, People for Animals, Greenpeace India.
- **Private Sector:** R&D divisions, environmental consultancies, IT startups.