BAREILLY INTERNATIONAL UNIVERSITY, BAREILLY
FACULTY OF PARAMEDICAL SCIENCES

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CRITERIA-1
(1.1.1)

Rohilkhand Medical College Campus, Pilibhit by Pass Road, Bareilly. (U.P) – 243006 INDIA
Phone:- 0581-2526011, 2526012 (EPABX) Fax: 2526054, 2303345
E-mail: info@rmcbareilly.com, www.rmcbareilly.com

CURRICULUM DEVELOPMENT AND IMPLEMENTATION IN ALIGNMENT WITH HEALTHCARE NEEDS POLICY

Purpose

This policy aims to ensure that the curricula developed and implemented by the university are aligned with local, national, regional, and global healthcare needs. The policy underscores the commitment to equipping students with the skills and knowledge necessary to address healthcare challenges effectively. The curriculum is designed to meet the norms set by relevant regulatory bodies and to reflect the university's commitment to high academic and professional standards.

Objectives

1. To develop curricula that address pressing healthcare issues at local, national, and global levels.
2. To ensure that Programme Outcomes (POs) and Course Outcomes (COs) are aligned with the healthcare sector's evolving demands.
3. To comply with the guidelines and norms of regulatory bodies, ensuring credibility and standardization.
4. To integrate interdisciplinary approaches, innovation, and emerging trends into healthcare education.
5. To prepare graduates to excel in professional practice, research, and community service in the healthcare domain.

Scope

This policy applies to all healthcare-related programs offered by the university, including undergraduate, postgraduate, and doctoral degrees in medicine, pharmacy, nursing, public health, allied health sciences, and other healthcare disciplines.

Policy Guidelines

1. Alignment with Healthcare Needs

- **Local Needs:** Incorporate community health issues, local epidemiological patterns, and cultural practices into the curriculum.
- **National Needs:** Focus on addressing key health challenges in line with national health policies (e.g., National Health Mission, Ayushman Bharat).
- **Regional Needs:** Emphasize training to address healthcare disparities and region-specific diseases.
- **Global Needs:** Include global health trends, international best practices, and universal health coverage concepts in the curriculum.

2. Curriculum Development Framework

- **Programme Outcomes (POs):**
    - Clearly defined, measurable objectives that align with the graduate's expected competencies.
    - Emphasize critical thinking, ethical decision-making, and interdisciplinary collaboration.
- **Course Outcomes (COs):**
    - Specific learning objectives for each course, designed to contribute to the broader POs.
    - Tailored to include clinical competencies, technical skills, and healthcare system insights.

- **Stakeholder Engagement:**
    - Input from faculty, students, alumni, employers, industry experts, and healthcare professionals.
    - Regular consultations with advisory boards to incorporate feedback and emerging trends.

3. Regulatory Compliance

- Adherence to standards and guidelines from relevant regulatory bodies (e.g., National Medical Commission, Pharmacy Council of India, Indian Nursing Council).
- Periodic curriculum reviews to ensure compliance with updated regulatory requirements.

4. Curriculum Features

- **Competency-Based Education:** Emphasis on hands-on training, problem-solving, and real-world application of knowledge.
- **Interdisciplinary Approach:** Collaboration between departments and integration of fields like data science, AI in healthcare, and public health.
- **Community-Based Learning:** Inclusion of community outreach programs, rural internships, and public health projects.
- **Global Exposure:** Opportunities for international collaboration, exchange programs, and access to global healthcare resources.

5. Implementation and Monitoring

- **Curriculum Committee:**
    - A dedicated committee responsible for curriculum design, implementation, and periodic review.
    - Representation from faculty, healthcare industry, alumni, and regulatory bodies.
- **Programme Outcomes Assessment:**
    - Regular evaluation of POs and COs through feedback from stakeholders, examination results, and graduate performance.
    - Continuous quality improvement through corrective actions based on assessment outcomes.

Operational Steps

1. **Needs Analysis:**
    - Conduct surveys and studies to identify healthcare challenges and skills gaps.
    - Collaborate with public health authorities and healthcare providers to align curricula with sectoral needs.
2. **Design and Development:**
    - Establish clear POs and COs reflecting healthcare priorities.
    - Incorporate new teaching-learning methods, including simulation-based training and e-learning modules.
3. **Approval and Accreditation:**
    - Submit curricula to regulatory bodies for approval and accreditation.
    - Ensure alignment with national and international quality assurance frameworks.
4. **Implementation:**

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- Deliver curricula using a mix of lectures, practicals, fieldwork, and research.
- Provide faculty training to adopt innovative and effective teaching methodologies.

5. **Monitoring and Review:**
   - Conduct annual curriculum reviews to incorporate feedback and emerging trends.
   - Use key performance indicators (KPIs) to measure the effectiveness of curricula.

Accessibility

- The POs and COs for each program will be published on the university's website for transparency.
- Curriculum details will be shared with all stakeholders through official platforms and orientation sessions.

Conclusion

This policy ensures that the curricula offered by the university are dynamic, comprehensive, and relevant to healthcare challenges at all levels. By fostering innovation, ethical practice, and global competencies, the university aims to prepare healthcare professionals who can contribute meaningfully to society.

BAREILLY INTERNATIONAL UNIVERSITY

(Established Under Govt. of U.P. act 26 of 2016)
Pilibhit Bypass Road, Bareilly-243006 (U.P.) INDIA
Phone : 0581-2526011-12, Fax : 0581-2303345 Email : info@biu.edu.in Website : www.biu.edu.in

Constitution of Academic Council

In consonance with the UGC norms and as per the university act, 2016 (UP Act, 26 of 2016) sec-24 (2) the Academic Council is constituted as under:

Date: 15/12/2024

Sr/No.	Name	Designation	Responsibility
1	Dr. Lata Agarwal	Vice-Chancellor	Chairperson
2	Dr. Kiran Agrawal	Pro- Vice Chancellor	Member
3	Dr. Digvijay Singh	Principal, RMCH	Member
4	Dr. H.K Premi	Controller of Examination	Member
5	Dr. Sathyajith Naik.N	Principal, IDS	Member
6	Dr. Priyanka A Masih	Principal, RNS/RCN	Member
7	Dr. Pushpendra Kannojia	Principal, BIU Pharmacy	Member
8	Dr. R.K. Tiwari	Principal, RAMCH	Member
9	Dr. Abnish Singh	Principal, BIUCHJ	Member
10	Mrs. Nidhi Gangwar	Principal KCOP	Member
11	Dr. Prashant Gupta	Principal, Faculty of Paramedical Sciences	Member
12	Dr. Sharad Seth	Prof. RMCH	Member
13	Dr Gokkula Krishna	Prof. IDS	Member
14	Dr. Shivangi Sharma	Associate Professor, IDS	Member
15	Dr. Sanasam Birjeni Devi	Associate Professor, RCN	Member
16	Dr. Varnika Saxena	Assistant Professor, IDS	Member
17	Ms. Shivani Sharma	Assistant Professor, FOFS	Member
18	Dr. S.K Thakur	Registrar	Member Secretary

Registrar

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Bareilly International University

17th Academic Council

Minutes of Meeting

As per schedule, the 17th Academic Council meeting was held on 31st July, 2024 at 11:00 AM in the RMCH College Council Room to discuss various agenda points.

Members were present

Sr/No.	Name
1	Dr. Lata Agarwal
2	Dr. Kiran Agrawal
3	Dr. Digvijay Singh
4	Dr. H.K Premi
5	Dr. Sathyajith Naik.N
6	Dr. Pushpendra Kannojia
7	Dr. Priyanka A Masih
8	Dr. R.K Tiwari
9	Dr. Abnish Singh
10	Dr. Prashant Gupta
11	Dr. Sharad Seth
12	Dr. Gokkula Krishna
13	Dr. Shivangi Sharma
14	Dr. Sanasam Birjeni Devi
15	Dr. Vernika Saxena
16	Ms. Shivani Sharma
17	Dr. S.K. Thakur

No member absent

Proceedings for 17th Academic Council Meeting held 31st July, 2024.

Chairperson of the Academic Council Meeting, Dr. Lata Agrawal, Vice chancellor, BIU extended a warm welcome to all the Academic Council Members of the meeting. Following agenda points were discussed for further recommendation and approval.

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Agenda points were discussed and resolved as under:

Agenda Point No 1: Ratification of all resolutions/ATR of the Minutes of Meeting of the 16th Academic Council Meeting held on 29th Dec, 2023.

Resolution: All resolutions of 16th Academic Council Meeting held on 16th Dec, 2023 ratified and Confirmed by all members and approved by the chairperson.

(Annexure-1)

Agenda Point No 2: Proposal for the approval of synopsis submission of Medical PG students for 2024-25 Academic Session.

Resolution: All the members unanimously approved the proposal for synopsis submission of Medical PG students for 2024-25 Academic Session. This agenda point is taken from the RMCH BOS for AY 2024-25.

(Annexure: Refer to BOS RMCH)

Agenda Point No 3: Proposal for the approval of panel of examiners UG & PG medical programs for 2024-25 Academic Session.

Resolution: All the members unanimously approved Proposal for the panel of examiners for Medical UG & PG students for 2024-25 Academic Session. This agenda point is taken from the RMCH BOS for AY 2024-25.

(Annexure: Refer to BOS RMCH)

Agenda Point No 4: Proposal for the approval of syllabus as per NMC for Medical UG & PG programs For 2024-25 Academic Session.

Resolution: All the members unanimously approved Proposal for syllabus as per NMC for Medical UG & PG programs for 2024-25 Academic Session. This agenda point is taken from the RMCH BOS for AY 2024-25.

(Annexure: Refer to BOS RMCH)

Agenda Point No 5: Proposal for the approval of book list of Medical UG & PG programs for 2024-25 Academic Session.

Resolution: All the members unanimously approved Proposal for book list of Medical UG & PG programs for 2024-25 Academic Session. This agenda point is taken from the RMCH BOS for AY 2024-25.

(Annexure: Refer to BOS RMCH)

Agenda Point No 6: Proposal for the approval of Panel of Examiners for 2024-25 session for UG, PG And Diploma dental programs for 2024-25 Academic Session.

Resolution: All the members unanimously approved Proposal for Panel of Examiners for UG, PG and Diploma programs for 2024-25 Academic Session. This agenda point is Taken from the IDS BOS for AY 2024-25.

(Annexure: Refer to BOS IDS)

Agenda Point No 7: Proposal for the approval of Academic/Examination Calendar for 2024-25 Session for dental programs.

Resolution: All the members unanimously approved Proposal for Academic/Examination Calendar for 2024-25 session for dental programs. This agenda point is taken from The IDS BOS for AY 2024-25.

(Annexure: Refer to BOS IDS)

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Agenda Point No 8: Proposal for the approval of new syllabus for BAMS program for 2024-25 session.

Resolution: All the members unanimously approved Proposal for the new syllabus for BAMS Program for 2024-25 session. This agenda point is taken from the IDS BOS for AY 2024-25.

(Annexure: Refer to BOS RAMCH)

Agenda Point No 9: Proposal for the approval of new BAMS batch admission (Batch – 2023) process.

Resolution: All the members unanimously reviewed and discussed on the Proposal for the new Syllabus for BAMS program for 2024-25 session. This agenda point is taken from The IDS BOS for AY 2024-25.

(Annexure: Refer to BOS RAMCH)

Agenda Point No 10: Proposal for the approval of Transitional Curriculum of Batch 2023 for BAMS Program for 2024-25 session.

Resolution: All the members unanimously approved Proposal for the new syllabus for BAMS Program for 2024-25 session. This agenda point is taken from the IDS BOS for AY 2024-25.

(Annexure: Refer to BOS RAMCH)

Agenda Point No 11: Proposal for the University Main and Supplementary exam result of batch 2021 of BAMS program.

Resolution: All the members unanimously reviewed and discussed on Proposal for the new Syllabus for BAMS program for 2024-25 session. This agenda point is taken from The IDS BOS for AY 2024-25.

(Annexure: Refer to BOS RAMCH)

Agenda Point No 12: Proposal for the approval of Curriculum /Syllabus updation of BAMS program for 2024-25 session.

Resolution: All the members unanimously approved the Proposal for the new syllabus for Nursing programs for 2024-25 session. This agenda point is taken from the RCN BOS for AY 2024-25.

(Annexure: Refer to BOS RCN)

Agenda Point No 13: Proposal for the approval of Examination ordinance/Scheme updation/Revision Of nursing programs for 2024-25 session.

Resolution: All the members unanimously approved the Proposal for the Examination Ordinance/Scheme updation/Revision for Nursing programs for 2024-25 session. This agenda point is taken from the RCN BOS for AY 2024-25.

(Annexure: Refer to BOS RCN)

Agenda Point No 14: Proposal for the approval of result analysis of previous year of nursing programs.

Resolution: All the members unanimously reviewed and discussed on the Proposal for result Analysis of previous year. This agenda point is taken from the RCN BOS for AY 2024- 25.

(Annexure: Refer to BOS RCN)

Agenda Point No 15: Proposal for the approval of Implementation of NEP – 2020 for 2024-25 session.

Resolution: All the members unanimously reviewed and discussed and approved the Proposal For Implementation of NEP – 2020. This agenda point is taken from the RCN BOS For AY 2024- 25.

(Annexure: Refer to BOS RCN)

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Agenda Point No 16: Proposal for the approval of the academic calendar for 2024-25 session of all Nursing Programs.

Resolution: All the members unanimously approved the Proposal for academic calendar for 2024-25 .This agenda point is taken from the RCN BOS for AY 2024- 25.

(Annexure: Refer to BOS RCN)

Agenda Point No 17: Proposal for the approval of internal/external examiners for 2024-25 session.

Resolution: All the members unanimously approved the Proposal for internal/external Examiners for 2024-25 session.

(Annexure: Refer to BOS RCN)

Agenda Point No 18: Proposal for approval of the research/innovation status.

Resolution: All the members unanimously reviewed and discussed on the Proposal for Research/innovation activities. This agenda point is taken from the RCN BOS for AY 2024- 25.

(Annexure: Refer to BOS RCN)

Agenda Point No 19: Proposal for the approval of Faculty development programme, Research Publication/Book publish for 2024-25 session.

Resolution: All the members unanimously approved the Proposal for Faculty development Programme, Research publication/Book publish. This agenda point is taken from The RCN BOS for AY 2024- 25.

(Annexure: Refer to BOS RCN)

Agenda Point No 20: Proposal for the approval of Academic events/calendar/extra activities for AY 2024- 25.

Resolution: All the members unanimously approved the Proposal for academic Events/calendar/extra activities. This agenda point is taken from the RCN BOS for AY 2024- 25.

(Annexure: Refer to BOS RCN)

Agenda Point No 21: Proposal for the approval of program expansion/starting of new programs for AY 2024- 25.

Resolution: All the members unanimously approved the Proposal for program Expansion/starting of new programs. This agenda point is taken from the RCN BOS For AY 2024- 25.

(Annexure: Refer to BOS RCN)

Agenda Point No 22: Proposal for the approval of Collaboration with the different bodies (National/International) For AY 2024- 25.

Resolution: All the members unanimously approved the Proposal for Collaboration (National/International). This agenda point is taken from the RCN BOS for AY 2024- 25.

(Annexure: Refer to BOS RCN)

Agenda Point No 23: Proposal for the approval of Academic Audit for the last academic session 2023-24.

Resolution: All the members unanimously approved the Proposal for Academic Audit last Academic session 2023-24. This agenda point is taken from the RCN BOS for AY 2024- 25.



(Annexure: Refer to BOS RCN)

Agenda Point No 24: Proposal for the approval of Best practices for academic enrichment for AY 2024- 25.

Resolution: All the members unanimously approved the Proposal for Best practices for Academic enrichment. This agenda point is taken from the RCN BOS for AY 2024- 25.

(Annexure: Refer to BOS RCN)

Agenda Point No 25: Proposal for approval of Implementation of Choice Based Credit System (CBCS) for AY 2024- 25.

Resolution: All the members unanimously approved the Proposal for Implementation of Choice Based Credit System (CBCS). This agenda point is taken from the BIUCOP BOS for AY 2024- 25.

(Annexure: Refer to BOS BIUCOP)

Agenda Point No 25: Proposal for the approval of the Curriculum design committee formation for the 2024-25 session.

Resolution: All the members unanimously approved the Proposal for Curriculum design Committee formation. This agenda point is taken from the BIUCOP BOS for AY 2024- 25.

(Annexure: Refer to BOS BIUCOP)

Agenda Point No 26: Proposal for the approval of the Result analysis of last year for the 2024-25 session.

Resolution: All the members unanimously approved the Proposal for Result analysis of last Year. This agenda point is taken from the BIUCOP BOS for AY 2024- 25.

(Annexure: Refer to BOS BIUCOP)

Agenda Point No 27: Proposal for the approval of the Conference and Faculty development programs (FDP)/Workshop Conduction for the 2024-25 session.

Resolution: All the members unanimously approved the Proposal for Conference and Faculty Development programs (FDP)/Workshop Conduction. This agenda point is taken From the BIUCOP BOS for AY 2024- 25.

(Annexure: Refer to BOS BIUCOP)

Agenda Point No 28: Proposal for the approval of the Research/Innovation status/Book/Research Publication for the 2024-25 session.

Resolution: All the members unanimously reviewed and discussed on the Proposal for Research/Innovation status/Book/Research publication. This agenda point is Taken from the BIUCOP BOS for AY 2024- 25.

(Annexure: Refer to BOS BIUCOP)

Agenda Point No 29: Proposal for the approval of the Organization of Curricular and Co-Curricular Activities for the 2024-25 session.

Resolution: All the members unanimously approved the Proposal for Organization of Curricular and Co-Curricular activities. This agenda point is taken from the BIUCOP BOS for AY 2024- 25.

(Annexure: Refer to BOS BIUCOP)

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Agenda Point No 30: Proposal for the approval of the Industry & Academic National Collaboration for 2024-25 session.

Resolution: All the members unanimously approved the Proposal for Industry & Academic National Collaboration. This agenda point is taken from the BIUCOP BOS for AY 2024- 25.

(Annexure: Refer to BOS BIUCOP)

Agenda Point No 31: Proposal for the approval of the Best Practices for Academic enrichment for 2024-25 session.

Resolution: All the members unanimously approved the Proposal for Best Practices for Academic enrichment. This agenda point is taken from the BIUCOP BOS for AY 2024- 25.

(Annexure: Refer to BOS BIUCOP)

Agenda Point No 32: Proposal for the approval of the Curriculum updation/Syllabus updation for AY 2024- 25.

Resolution: All the members unanimously approved the Proposal for Curriculum Updation/Syllabus updation. This agenda point is taken from the KCOP BOS for AY 2024- 25.

(Annexure: Refer to BOS KCOP)

Agenda Point No 33: Proposal for the approval of the Examination ordinance/Admission Ordinance/Scheme updation/revision for AY 2024- 25.

Resolution: All the members unanimously approved the Proposal for Examination Ordinance/Admission ordinance/Scheme updation/revision. This agenda point is Taken from the KCOP BOS for AY 2024- 25.

(Annexure: Refer to BOS KCOP)

Agenda Point No 34: Proposal for the approval of the internal/external examiners for AY 2024- 25.

Resolution: All the members unanimously approved the Proposal for internal/external Examiners. This agenda point is taken from the KCOP BOS for AY 2024- 25.

(Annexure: Refer to BOS KCOP)

Agenda Point No 35: Proposal for the approval of the academic calendar of D.Pharm program for 2024-25.

Resolution: All the members unanimously approved the Proposal for academic calendar for 2024-25.This agenda point is taken from the KCOP BOS for AY 2024- 25.

(Annexure: Refer to BOS KCOP)

Agenda Point No 36: Proposal for the approval of the Expenditure Budget for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Expenditure Budget for 2024-25.This agenda point is taken from the KCOP BOS for AY 2024- 25.

(Annexure: Refer to BOS KCOP)

Agenda Point No 37: Proposal for the approval of the Question paper pattern for D. Pharm for the 2024-25 session.

Resolution: All the members unanimously approved the Proposal for Question paper pattern For D. Pharm for 2024-25.This agenda point is taken from the KCOP BOS for AY 2024- 25.

(Annexure: Refer to BOS KCOP)

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Agenda Point No 38: Proposal for the approval of Programme expansion/starting of new programmes For next academic session.

Resolution: All the members unanimously approved the Proposal for Programme Expansion/starting of new programmes. This agenda point is taken from the KCOP BOS for AY 2024- 25.

(Annexure: Refer to BOS KCOP)

Agenda Point No 39: Proposal for the approval of Curriculum updated/syllabus updation of B.Sc Forensic Science for 2024-25 session.

Resolution: All the members unanimously approved the Proposal for Curriculum Updated/syllabus updation of B.Sc Forensic Science. This agenda point is taken From the FOFS BOS for AY 2024- 25.

(Annexure: Refer to BOS FOFS)

Agenda Point No 40: Proposal for the approval of Examination ordinance/Scheme for 2024-25 session.

Resolution: All the members unanimously approved the Proposal for Examination Ordinance/Scheme. This agenda point is taken from the FOFS BOS for AY 2024- 25.

(Annexure: Refer to BOS FOFS)

Agenda Point No 41: Proposal for the approval of Admission ordinance of B.Sc Forensic Science for 2024-25 session.

Resolution: All the members unanimously approved the Proposal for Admission ordinance. This agenda point is taken from the FOFS BOS for 2024- 25.

(Annexure: Refer to BOS FOFS)

Agenda Point No 42: Proposal for approval of the result analysis of last academic year B.Sc Forensic Science.

Resolution: All the members unanimously approved the Proposal for result analysis of last Academic year. This agenda point is taken from the FOFS BOS for 2024- 25.

(Annexure: Refer to BOS FOFS)

Agenda Point No 43: Proposal for approval of Implementation of NEP – 2020 in the faculty of forensic Science for 2024-25 session.

Resolution: All the members unanimously approved the Proposal for Implementation of NEP – 2020. This agenda point is taken from the FOFS BOS for 2024- 25.

(Annexure: Refer to BOS FOFS)

Agenda Point No 44: Proposal for Panel of Examiners (internal & External) for AY 2024-25.

Resolution: All the members unanimously approved the Proposal for I Panel of Examiners (Internal & External) for AY 2024-25. This agenda point is taken from the FOFS BOS for 2024- 25.

(Annexure: Refer to BOS FOFS)

Agenda Point No 45: Proposal for approval of academic events/calendar/extra activity was approved For 2024-25 session.

Resolution: All the members unanimously approved the Proposal for academic Events/calendar/extra activity was approved. This agenda point is taken from the FOFS BOS for 2024- 25.

(Annexure: Refer to BOS FOFS)

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Agenda Point No 46: Proposal for the approval of ordinance and curriculum of M.Sc. Forensic Science For 2024-25 session.

Resolution: All the members unanimously approved the Proposal for ordinance and Curriculum of M.Sc Forensic Science. This agenda point is taken from the FOFS BOS for 2024- 25.

(Annexure: Refer to BOS FOFS)

Agenda Point No 47: Proposal for the approval of new Diploma program (Forensic Science, Questioned Documents And Fingerprinting) may be proposed to introduce in new academic Session.

Resolution: All the members unanimously approved the Proposal for new Diploma program (Forensic Science, Questioned Documents and Fingerprinting) may be proposed To introduce in new academic session. This agenda point is taken from the FOFS BOS for 2024- 25.

(Annexure: Refer to BOS FOFS)

Agenda Point No 48: Proposal for the approval of the Best Practices for Academic enrichment for 2024-25 session.

Resolution: All the members unanimously approved the Proposal for Best Practices for Academic enrichment. This agenda point is taken from the FOFS BOS for 2024- 25.

(Annexure: Refer to BOS FOFS)

Agenda Point No 49: Proposal for the approval of Curriculum updation/syllabus for 2024-25 session.

Resolution: All the members unanimously approved the Proposal for Curriculum updation/syllabus. This agenda point is taken from the FOPS BOS for 2024- 25.

(Annexure: Refer to BOS FOPS)

Agenda Point No 50: Proposal for the approval of Examination Ordinance/Schemes of paramedical Programs for 2024-25 session.

Resolution: All the members unanimously approved the Proposal for Examination Ordinance/Schemes. This agenda point is taken from the FOPS BOS for 2024- 25.

(Annexure: Refer to BOS FOPS)

Agenda Point No 51: Proposal for the approval of Admission ordinance of paramedical Programs for 2024-25 session.

Resolution: All the members unanimously approved the Proposal for Admission ordinance. This agenda point is taken from the FOPS BOS for 2024- 25.

(Annexure: Refer to BOS FOPS)

Agenda Point No 52: Proposal for the approval of panel of examiners of all paramedical Programs for 2024-25 session.

Resolution: All the members unanimously approved the Proposal for panel of examiners. This agenda point is taken from the FOPS BOS for 2024- 25.

(Annexure: Refer to BOS FOPS)

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Agenda Point No 53: Proposal for the approval of academic calendar of all paramedical Programs for 2024-25 session.

Resolution: All the members unanimously approved the Proposal for academic calendar for The 2024-25. This agenda point is taken from the FOPS BOS for 2024- 25.

(Annexure: Refer to BOS FOPS)

Agenda Point No 54: Proposal for approval of academic events etc. of all paramedical Programs for 2024-25 session.

Resolution: All the members unanimously approved the Proposal for academic events etc. This agenda point is taken from the FOPS BOS for 2024- 25.

(Annexure: Refer to BOS FOPS)

Agenda Point No 55: Proposal for the approval of Ordinance of new course M.Sc. clinical Embryology For 2024-25 session.

Resolution: All the members unanimously approved the Proposal for Ordinance for the new Course M.Sc. clinical Embryology. This agenda point is taken from the FOPS BOS For 2024- 25.

(Annexure: Refer to BOS FOPS)

Agenda Point No 56: Proposal for the approval of new program like M.Sc (MLT), MPT & B.Sc (OT) may Be proposed to Introduced in new academic session.

Resolution: All the members unanimously approved the Proposal for new program like M.Sc (MLT), MPT & B.Sc (OT) may be proposed to introduced in new academic session. This agenda point is taken from the FOPS BOS for 2024- 25.

(Annexure: Refer to BOS FOPS)

Agenda Point No 57: Proposal for the approval of academic calendar of all paramedical programs for 2024-25.

Resolution: All the members unanimously approved the Proposal for academic calendar for 2024-25.This agenda point is taken from the BIUCOM BOS for 2024- 25.

(Annexure: Refer to BOS BIUCOM)

Agenda Point No 58: Proposal for the approval of Ordinance for B.A. (Mass Communication) and MA (Political Science) Under CBCS for 2024-25 session.

Resolution: All the members unanimously approved the Proposal for Ordinance for B.A. (Mass Communication) and MA (Political Science) under CBCS. This agenda point Is taken from the BIUCOM BOS for 2024- 25.

(Annexure: Refer to BOS BIUCOM)

Agenda Point No 59: Proposal for the approval of Examination Ordinances for 2024-25 session.

Resolution: All the members unanimously approved the Proposal for Examination Ordinances. This agenda point is taken from the BIUCOM BOS for 2024- 25.

(Annexure: Refer to BOS BIUCOM)

Agenda Point No 60: Proposal for the approval of POs & COs for the above mentioned programmes For 2024-25 session.

Resolution: All the members unanimously approved the Proposal for POs & COs for above Mentioned programmes. This agenda point is taken from the BIUCOM BOS for 2024- 25.

(Annexure: Refer to BOS BIUCOM)

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Agenda Point No 61: Proposal for the approval of CBSE – Based syllabus of B.A. (Mass Communication) And MA (Political Science) for 2024-25 session.

Resolution: All the members unanimously approved the Proposal for CBSE – Based syllabus of B.A. (Mass Communication) and MA (Political Science).This agenda point is taken From the BIUCOM BOS for 2024- 25.

(Annexure: Refer to BOS BIUCOM)

Agenda Point No 62: Proposal for the approval of Guidelines relating to project work for 2024-25 Session.

Resolution: All the members unanimously approved the Proposal for Guidelines relating to Project work. This agenda point is taken from the BIUCOM BOS for 2024- 25.

(Annexure: Refer to BOS BIUCOM)

Agenda Point No 63: Proposal for approval of Panel of External and Internal Examiners for 2024-25 Session.

Resolution: All the members unanimously approved the Proposal for Panel of External and Internal Examiners. This agenda point is taken from the BIUCOM BOS for 2024- 25.

(Annexure: Refer to BOS BIUCOM)

Agenda Point No 64: Proposal for approval of Question paper formats for 2024-25 session.

Resolution: All the members unanimously approved the Proposal for Question paper formats. This agenda point is taken from the BIUCOM BOS for 2024- 25.

(Annexure: Refer to BOS BIUCOM)

Agenda Point No 65: Proposal for approval of Result analysis of B.A. (Mass Communication) of last Year.

Resolution: All the members unanimously approved the Proposal for Result analysis of B.A. (Mass Communication) of last year. This agenda point is taken from the BIUCOM BOS for 2024- 25.

(Annexure: Refer to BOS BIUCOM)

Agenda Point No 66: Proposal for approval of academic Events for 2024-25 session.

Resolution: All the members unanimously approved the Proposal for academic Events. This Agenda point is taken from the BIUCOM BOS for 2024- 25.

(Annexure: Refer to BOS BIUCOM)

Agenda Point No 67: Proposal for approval of examination ordinance and scheme for MHA program For 2024-25 session.

Resolution: All the members unanimously approved the Proposal for examination ordinance And scheme for MHA program. This Agenda point is taken from the BIUCOM BOS for 2024- 25.

(Annexure: Refer to BOS BIUCOM)

Agenda Point No 68: Proposal for the approval of admission ordinance for MHA program for 2024-25 Session.

Resolution: All the members unanimously approved the Proposal for admission ordinance for MHA program. This Agenda point is taken from the BIUCOM BOS for 2024- 25.

(Annexure: Refer to BOS BIUCOM)

FACULTY OF PARAMEDICAL SCIENCE
Principal
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Agenda Point No 69: Proposal for the approval of implementation of NEP – 2020 for MHA program for 2024-25 session.

Resolution: All the members unanimously approved the Proposal for Implementation of NEP – 2020 for MHA program. This Agenda point is taken from the BIUCOM BOS For 2024- 25.

(Annexure: Refer to BOS BIUCOM)

Agenda Point No 70: Proposal for the approval of academic calendar of MHA program for 2024-25 Session of MHA program.

Resolution: All the members unanimously approved the Proposal for academic calendar for 2024-25. For MHA program. This Agenda point is taken from the BIUCOM BOS For 2024- 25.

(Annexure: Refer to BOS BIUCOM)

Agenda Point No 71: Proposal for the approval of academic events etc. for MHA program for 2024-25 Session.

Resolution: All the members unanimously approved the Proposal for academic events etc. for 2024-25. For MHA program. This Agenda point is taken from the BIUCOM BOS For 2024- 25.

(Annexure: Refer to BOS BIUCOM)

Agenda Point No 72: Proposal for the approval of academic calendar for 2024-25 session.

Resolution: All the members unanimously approved the Proposal for academic calendar for 2024-25.This agenda point is taken from the BIUCHJ BOS for 2024- 25.

(Annexure: Refer to BOS BIUCHJ)

Agenda Point No 73: Proposal for the approval of Ordinance for B.A. (Mass Communication) and MA (Political Science) Under CBCS.

Resolution: All the members unanimously approved the Proposal for Ordinance for B.A. (Mass Communication) and MA (Political Science) under CBCS. This agenda point Is taken from the BIUCHJ BOS for 2024- 25.

(Annexure: Refer to BOS BIUCHJ)

Agenda Point No 74: Proposal for the approval of Examination Ordinances for 2024-25 session.

Resolution: All the members unanimously approved the Proposal for Examination Ordinances. This agenda point is taken from the B BIUCHJ BOS for 2024- 25.

(Annexure: Refer to BOS BIUCHJ)

Agenda Point No 75: Proposal for the approval of POs & COs for the above mentioned programmes.

Resolution: All the members unanimously approved the Proposal for POs & COs for above Mentioned programmes. This agenda point is taken from the BIUCHJ BOS for 2024- 25.

(Annexure: Refer to BOS BIUCHJ)

Agenda Point No 76: Proposal for the approval of CBSE – Based syllabus of B.A. (Mass Communication) And MA (Political Science).

Resolution: All the members unanimously approved the Proposal for CBSE – Based syllabus of B.A. (Mass Communication) and MA (Political Science).This agenda point is taken From the BIUCHJ BOS for 2024- 25. **(Annexure: Refer to BOS BIUCHJ)**

FACULTY OF PARAMEDICAL SCIENCE SHANTI Principal BAREILLY

Agenda Point No 77: Proposal for the approval of Guidelines relating to project work for AY: 2024- 25.

Resolution: All the members unanimously approved the Proposal for Guidelines relating to Project work. This agenda point is taken from the BIUCHJ BOS for 2024- 25.

(Annexure: Refer to BOS BIUCHJ)

Agenda Point No 78: Proposal for the approval of Panel of External and Internal Examiners for AY: 2024- 25.

Resolution: All the members unanimously approved the Proposal for Panel of External and Internal Examiners. This agenda point is taken from the BIUCHJ BOS for 2024- 25.

(Annexure: Refer to BOS BIUCHJ)

Agenda Point No 79: Proposal for the approval of Question paper formats AY: 2024- 25.

Resolution: All the members unanimously approved the Proposal for Question paper formats. This agenda point is taken from the BIUCHJ BOS for 2024- 25.

(Annexure: Refer to BOS BIUCHJ)

Agenda Point No 80: Proposal for the approval of Result analysis of B.A. (Mass Communication) of last Year.

Resolution: All the members unanimously approved the Proposal for Result analysis of B.A. (Mass Communication) of last year. This agenda point is taken from the BIUCHJ BOS for 2024- 25.

(Annexure: Refer to BOS BIUCHJ)

Agenda Point No 81: Proposal for the approval of academic Events for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for academic Events. This Agenda point is taken from the BIUCHJ BOS for 2024- 25.

(Annexure: Refer to BOS BIUCHJ)

Agenda Point No 82: Proposal for the approval of result analysis of last year.

Resolution: All the members unanimously approved the Proposal for result analysis of last Year. This Agenda point is taken from the RCN BOF for 2024- 25.

(Annexure: Refer to BOF RCN)

Agenda Point No 83: Proposal for the approval of Implementation of NEP – 2020 for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Implementation of NEP – 2020. Agenda point is taken from the RCN BOF for 2024- 25.

(Annexure: Refer to BOF RCN)

Agenda Point No 84: Proposal for the approval of internal/external examiners for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for internal/external Examiners. Agenda point is taken from the RCN BOF for 2024- 25.

(Annexure: Refer to BOF RCN)

Agenda Point No 85: Proposal for the approval of academic calendar for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for academic calendar for 2024-25. Agenda point is taken from the RCN BOF for 2024- 25.

(Annexure: Refer to BOF RCN)

Agenda Point No 86: Proposal for the approval of Research/innovation status AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Research/innovation Status. For 2024-25. Agenda point is taken from the RCN BOF for 2024-25

(Annexure: Refer to BOF RCN)

FACULTY OF PARAMEDICAL SCIENCE
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BAREILLY

Agenda Point No 87: Proposal for the approval of Faculty development programme, Research Publication/Book Publish for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Faculty developme Programme, Research publication/Book publish. For 2024-25. Agenda point Taken from the RCN BOF for 2024- 25.

(Annexure: Refer to BOF

Agenda Point No 88: Proposal for the approval of Academic events/calendar/extra activities for A 2024-25.

Resolution: All the members unanimously approved the Proposal for Academic Events/calendar/extra activities. For 2024-25. Agenda point is Taken from the RCN BOF for 2024- 25.

(Annexure: Refer to BOF

Agenda Point No 89: Proposal for the approval of Programme expansion/starting of new program For next academic session.

Resolution: All the members unanimously approved the Proposal for Programme Expansion/starting of new programmes. For 2024-25. Agenda point is Taken from the RCN BOF for 2024- 25.

(Annexure: Refer to BOF

Agenda Point No 90: Proposal for the approval of Collaboration (National/International) for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Collaboration (National/International). Agenda point is Taken from the RCN BOF for 2024- 25.

(Annexure: Refer to BOF

Agenda Point No 91: Proposal for the approval of Academic Audit of last academic year.

Resolution: All the members unanimously approved the Proposal for Academic Audit of Academic year. Agenda point is taken from the RCN BOF for 2024- 25.

(Annexure: Refer to BOF

Agenda Point No 92: Proposal for the approval of Expenditure Budget for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Expenditure Budg Agenda point is taken from the RCN BOF for 2024- 25.

(Annexure: Refer to BOF

Agenda Point No 93: Proposal for the approval of Best practices for academic enrichment for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Best practices for Academic enrichment. Agenda point is taken from the RCN BOF for 2024-

(Annexure: Refer to BOF

Agenda Point No 94: Proposal for the approval of Research/innovation status for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Research/innovat Status. Agenda point is taken from the RCN BOF for 2024- 25.

(Annexure: Refer to BOI

Agenda Point No 95: Proposal for the approval of the Faculty development programme, Research Publication/Book Publish for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Faculty development Programme, Research publication/Book publish. Agenda point is taken from the RCN BOF for 2024- 25.

(Annexure: Refer to BOF RCN)

Agenda Point No 96: Proposal for the approval of the Implementation of Choice Based Credit System (CBCS) for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Implementation of Choice Based Credit System (CBCS). Agenda point is taken from the BIUCOP BOF For 2024- 25.

(Annexure: Refer to BOF BIUCOP)

Agenda Point No 97: Proposal for the approval of Curriculum design committee formation for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Curriculum design Committee formation. Agenda point is taken from the BIUCOP BOF For 2024- 25.

(Annexure: Refer to BOF BIUCOP)

Agenda Point No 98: Proposal for the approval of result analysis of last year.

Resolution: All the members unanimously approved the Proposal for result analysis of last Year. Agenda point is taken from the BIUCOP BOF For 2024- 25.

(Annexure: Refer to BOF BIUCOP)

Agenda Point No 99: Proposal for the approval of Conference and Faculty development programs (FDP)/Workshop Conduction for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Conference and Faculty Development programs (FDP)/Workshop conduction. Agenda point is taken from The BIUCOP BOF for 2024- 25.

(Annexure: Refer to BOF BIUCOP)

Agenda Point No 100: Proposal for the approval of Research/Innovation status/Book/Research Publication for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Research/Innovation Status/Book/Research publication. Agenda point is taken from the BIUCOP BOF For 2024- 25.

(Annexure: Refer to BOF BIUCOP)

Agenda Point No 101: Proposal for Organization of Curricular and Co-Curricular activities for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Organization of Curricular and Co-Curricular activities. Agenda point is taken from the BIUCOP BOF for 2024- 25.

(Annexure: Refer to BOF BIUCOP)

Agenda Point No 102: Proposal for the approval of Industry & Academic National Collaboration for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Industry & Academic National Collaboration. Agenda point is taken from the BIUCOP BOF for 2024- 25. **(Annexure: Refer to BOF BIUCOP)**



Agenda Point No 103: Proposal for the approval of Best Practices for Academic enrichment for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Best Practices for Academic enrichment. Agenda point is taken from the BIUCOP BOF for 2024- 25.

(Annexure: Refer to BOF BIUCOP)

Agenda Point No 104: Proposal for the approval of Implementation of NEP – 2020 for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Implementation of NEP – 2020. Agenda point is taken from the KCOP BOF for 2024- 25.

(Annexure: Refer to BOF KCOP)

Agenda Point No 105: Proposal for the approval of result analysis of last year.

Resolution: All the members unanimously approved the Proposal for result analysis of last Year. Agenda point is taken from the KCOP BOF for 2024- 25.

(Annexure: Refer to BOF KCOP)

Agenda Point No 106: Proposal for the approval of Conference and Faculty development programme For AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Conference and Faculty Development programme. Agenda point is taken from the KCOP BOF for 2024- 25.

(Annexure: Refer to BOF KCOP)

Agenda Point No 107: Proposal for the approval of Research/innovation status/Book/Research Publication for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Research/innovation Status/Book/Research publication. Agenda point is taken from the KCOP BOF for 2024- 25.

(Annexure: Refer to BOF KCOP)

Agenda Point No 108: Proposal for the approval of Academic events status/Calendar/Extra Activities For AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Academic events Status/Calendar/Extra Activities. Agenda point is taken from the KCOP BOF for 2024- 25.

(Annexure: Refer to BOF KCOP)

Agenda Point No 109: Proposal for the approval of Best practices for academic enrichment For AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Best practices for Academic enrichment. Agenda point is taken from the KCOP BOF for 2024- 25.

(Annexure: Refer to BOF KCOP)

Agenda Point No 110: Proposal for the approval of result of last year.

Resolution: All the members unanimously approved the Proposal for result of last year. This Agenda point is taken from the FOFS BOF for 2024- 25.

(Annexure: Refer to BOF FOFS)

FACULTY OF PARAMEDICAL SCIENCE
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Agenda Point No 111: Proposal for the approval of research in subject specialization and Interdisciplinary for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for research in subject Specialization and interdisciplinary. This agenda point is taken from the FOFS BOF for 2024- 25.

(Annexure: Refer to BOF FOFS)

Agenda Point No 112: Proposal for the approval of publications in peer reviewed journals of their Dissertation work for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for publications in peer Reviewed journals of their dissertation work. This agenda point is taken from the FOFS BOF for 2024- 25.

(Annexure: Refer to BOF FOFS)

Agenda Point No 113: Proposal for the approval of academic events etc. for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for academic events Etc. This agenda point is taken from the FOFS BOF for 2024- 25.

(Annexure: Refer to BOF FOFS)

Agenda Point No 114: Proposal for the approval of Collaboration/MoUs for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Collaboration/MoUs. This agenda point is taken from the FOFS BOF for 2024- 25.

(Annexure: Refer to BOF FOFS)

Agenda Point No 115: Proposal for the approval of best practice for academic enrichment for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for best practice for Academic enrichment this agenda point is taken from the FOFS BOF for 2024- 25.

(Annexure: Refer to BOF FOFS)

Agenda Point No 116: Proposal for the approval of result of last year.

Resolution: All the members unanimously approved the Proposal for result of last year. This Agenda point is taken from the FOPS BOF for 2024- 25.

(Annexure: Refer to BOF FOPS)

Agenda Point No 117: Proposal for the approval of research in subject specialization and Interdisciplinary for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for research in subject Specialization and interdisciplinary. This agenda point is taken from the FOPS BOF for 2024- 25.

(Annexure: Refer to BOF FOPS)

Agenda Point No 118: Proposal for the approval of publications in peer reviewed journals of their Dissertation work for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for publications in peer Reviewed journals of their dissertation work. This agenda point is taken from the FOPS BOF for 2024- 25.

(Annexure: Refer to BOF FOPS)

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Agenda Point No 119: Proposal for the approval of academic events etc. for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for academic events Etc. This agenda point is taken from the FOPS BOF for 2024- 25.

(Annexure: Refer to BOF FOPS)

Agenda Point No 120: Proposal for the approval of Collaboration/MoUs for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Collaboration/MoUs. This agenda point is taken from the FOPS BOF for 2024- 25.

(Annexure: Refer to BOF FOPS)

Agenda Point No 121: Proposal for the approval of Academic audit report and expenditure budget for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Academic audit report And expenditure budget. This agenda point is taken from the FOPS BOF for 2024- 25.

(Annexure: Refer to BOF FOPS)

Agenda Point No 122: Proposal for the approval of Best practice for academic enrichment for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Best practice for Academic enrichment. This agenda point is taken from the FOPS BOF for 2024- 25.

(Annexure: Refer to BOF FOPS)

Agenda Point No 123: Proposal for the approval of result analysis of last year of MHA program for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for result analysis of last Year of MHA program. This agenda point is taken from the BIUCOM BOF for 2024- 25.

(Annexure: Refer to BOF BIUCOM)

Agenda Point No 124: Proposal for the approval of Research/Innovation status/Book/Research Publication for MHA Program for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Research/Innovation Status/Book/Research publication for MHA program. This agenda point is taken From the BIUCOM BOF for 2024- 25.

(Annexure: Refer to BOF BIUCOM)

Agenda Point No 125: Proposal for the approval of Faculty development programs/Research/Booklist. For MHA Program for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Faculty development Programs/Research/Booklist for MHA program. This agenda point is taken from The BIUCOM BOF for 2024- 25.

(Annexure: Refer to BOF BIUCOM)

Agenda Point No 126: Proposal for the approval of academic audit for MHA Program for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for academic audit for MHA Program. This agenda point is taken from the BIUCOM BOF for 2024- 25.

(Annexure: Refer to BOF BIUCOM)

FACULTY OF PARAMEDICAL SCIENCE SHIATS Principal BAREILLY

Agenda Point No 127: Proposal for the approval of Best Practices for Academic enrichment for MHA Program for AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for Best Practices for Academic enrichment for MHA program. This agenda point is taken from the BIUCOM BOF for 2024- 25.

(Annexure: Refer to BOF BIUCOM)

Agenda Point No 128: Proposal for the starting the BCA (IT & Multimedia) course in BIU College of Management from AY: 2024-25.

Resolution: All the members unanimously approved the Proposal for starting the BCA (IT & Multimedia) course in BIU College of Management from AY: 2024-25.

(Annexure: Refer to BOS BIUCOM)

Agenda Point No 129: Proposal for the approval of consent letter for the affiliation of BIU College of Management with BCA (IT & Multimedia), BBA (Finance & Taxation), B.Com (Hons.), Master of Public Health (MPH), Master of Hospital Administration (MHA) courses.

Resolution: All the members unanimously approved the Proposal for approval of consent letter for the affiliation of BIU College of Management with BCA (IT & Multimedia), BBA (Finance & Taxation), B.Com (Hons.), Master of Public Health (MPH), Master of Hospital Administration (MHA) courses.

(Annexure: Refer to BOS BIUCOM)

No other points were discussed and the meeting ended with the vote of thanks to the chair.

Registrar

FACULTY OF PARAMEDICAL SCIENCES
ASHANT
Principal
BAREILLY

BAREILLY INTERNATIONAL UNIVERSITY

Faculty of Paramedical Sciences

Rohilkhand Medical College & Hospital Campus, Pilibhit by Pass Road, Bareilly.
(U.P) – 243006 INDIA
E-mail: facultyofparamedicalsciences@gmail.com

Reasons for Revision of Curriculum

Introduction

To keep pace with advancements in medical and health sciences, regular syllabus updates are essential. These revisions ensure that students gain industry-relevant knowledge and practical expertise, improving their career readiness. The key objectives of these revisions include:

- Incorporating new developments and modern methodologies in respective fields.
- Aligning curricula with the Choice-Based Credit System (CBCS) for academic flexibility.
- Enhancing hands-on training by restructuring practical components.
- Reducing redundant topics while improving conceptual clarity.
- Standardizing assessment methods for fair and transparent evaluations.

By implementing these changes, students receive a well-rounded education that meets current industry demands and prepares them for future advancements.

Syllabus Revision Overview

B.Sc. (Medical Laboratory Technology) - B.Sc. (MLT)		
Year	**Revisions**	**Necessity**
2017-18	New course introduced to meet demand for skilled laboratory professionals.	Addressing industry demand for trained MLT professionals.
2018-19	Syllabus revised to align with industry standards; internal & external examiner proposals discussed.	Ensuring standardized evaluation and updated knowledge.
2019-20	Ordinances revised for consistency; subsidiary subjects declared Non-University Examination; practical syllabus modified for core techniques.	Reducing academic burden and improving core skill focus.
2020-21	Ordinance updated to include advancements in laboratory sciences.	Keeping up with latest laboratory technologies.
2021-22	No changes due to recent syllabus updates.	Stability maintained after prior updates.
2022-23	"Dissertation" introduced in VI Semester; syllabus revised to include modern diagnostic methodologies.	Encouraging research and hands-on diagnostic skills.
2023-24	Curriculum updated as per CBCS; examination ordinance updated; practical subjects revised and separated.	Providing academic flexibility and improving practical exposure.

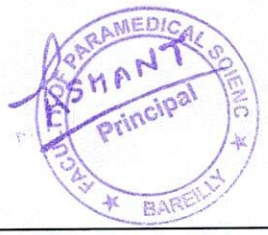
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Bachelor of Physiotherapy - BPT		
Year	**Revisions**	**Necessity**
2017-18	New course introduced for physiotherapy professionals.	Addressing the growing need for physiotherapy experts.
2018-19	Syllabus updated with advanced techniques and evaluation methods.	Ensuring modern rehabilitation techniques are covered.
2019-20	Practical syllabus removed for V & VI Semester to improve specialization.	Reducing redundancy and enhancing focused learning.
2020-21	Major syllabus revisions: Pathology divided into General & Systemic; Walking Aids & Suspension Therapy added; Electrotherapy & Clinical Neurology expanded; unnecessary topics removed.	Structuring learning progression and keeping content relevant.
2021-22	Ordinance revised for curriculum coherence.	Maintaining logical flow and structured education.
2022-23	"Dissertation" added in VIII Semester for evidence-based practice.	Promoting research and practical problem-solving.
2023-24	CBCS adopted; assessment scheme improved; Anatomy & Physiology adjusted for better integration; Biochemistry split into two parts.	Enhancing subject coherence and flexible learning.

B.Sc. (Optometry)		
Year	**Revisions**	**Necessity**
2019-20	New course introduced for skilled optometrists.	Meeting the increasing need for optometry specialists.
2020-21	Ordinance revised for core subject focus; practical subjects merged; General Anatomy updated.	Ensuring essential knowledge and streamlining learning.
2021-22	Further syllabus alignment with emerging trends.	Keeping up with modern optometry practices.
2022-23	Ordinance updated for clarity and subject coverage.	Improving course structure and coherence.
2023-24	CBCS introduced; examination scheme standardized; practical subjects revised; General Anatomy adjusted.	Increasing academic flexibility and improving assessments.



B.Sc. (Radiology & Imaging Technology) - B.Sc. (RIT)		
Year	**Revisions**	**Necessity**
2020-21	New course launched to train professionals in radiological techniques.	Addressing the demand for trained radiology experts.
2021-22	Ordinance revised to match technological advancements.	Keeping syllabus in sync with modern imaging techniques.
2022-23	Ordinance and syllabus revised to include latest imaging techniques.	Ensuring students are trained in up-to-date diagnostic methods.
2023-24	CBCS adopted; assessment methods improved; foundational subjects reinforced; Biochemistry split into two semesters.	Providing modular learning and reinforcing core subjects.



BAREILLY INTERNATIONAL UNIVERSITY

Pilibhit Bypass Road, Bareilly, Uttar Pradesh (U.P.)
Phone: 0581-2526051 Fax: 0581-2526054
E-mail: info@biu.edu.in website : www.biu.edu.in

Date: 17th May, 2024

Subject: Notification for the constitution of BOF for the Faculty of Paramedical Sciences for the session 2023-24.

To	Principal, Faculty of Paramedical Sciences
From	Registrar
Subject	Notification for the constitution of BOF for the Faculty of Paramedical Sciences for the session 2023-24.

Dear Sir,

This is to notify that the Board of Faculty (BOF) for Faculty of Paramedical Sciences for 2023-24 session is constituted as under:

Sr.No.	Name	Designation	Role of Member
1	Dr. Pushpendra Kannojia	Principal	Chairperson
2	Dr. Pramod Kumar	Professor	Member
3	Dr. Nitesh Mohan	Professor	Member
4	Dr. Ritu Jain	Professor	Member
5	Ms. Nidhi Singh	Associate Professor	Member
6	Ms. Tabassum Fatma	Assistant Professor	Member
7	Mrs. Manisha Saxena	Assistant Professor	Member
8	Mr. Sunil Kumar Gupta	Associate Professor	External Member

This is for your information and necessary action please.

Registrar

Copy To :

(i) Hon'ble Vice – Chancellor (For information please)
(ii) Guard File

FACULTY OF PARAMEDICAL SCIENCE
SHANT
Principal
BAREILLY

BAREILLY INTERNATIONAL UNIVERSITY
Pilibhit Bypass Road, Bareilly, Uttar Pradesh (U.P.)
Phone: 0581-2526051 Fax: 0581-2526054
E-mail: info@biu.edu.in website : www.biu.edu.in

Date: 17th May, 2024

Subject: Notification for the constitution of BOS for the Faculty of Paramedical Sciences for the session 2023-24.

To	Principal, Faculty of Paramedical Sciences
From	Registrar
Subject	Notification for the constitution of BOS for the Faculty of Paramedical Sciences for the session 2023-24.

Dear Sir,

This is to notify that the Board of Studies (BOS) for Faculty of Paramedical Sciences for 2023-24 session is constituted as under:

Sr.No.	Name	Designation	Role of Member
1	Dr. Pushpendra Kannojia	Principal	Chairperson
2	Dr. Pramod Kumar	Professor	Member
3	Dr. Nitesh Mohan	Professor	Member
4	Dr. Ritu Jain	Professor	Member
5	Ms. Nidhi Singh	Associate Professor	Member
6	Ms. Tabassum Fatma	Assistant Professor	Member
7	Dr. Sakshi Bhatnagar (PT)	Assistant Professor	Member
8	Mrs. Manisha Saxena	Assistant Professor	Member
9	Mr. Sunil Kumar Gupta	Associate Professor	External Member

This is for your information and necessary action please.

Registrar

Copy To :

(i) Hon'ble Vice – Chancellor (For information please)
(ii) Guard File

FACULTY OF PARAMEDICAL SCIENCES
HANT
Principal
BAREILLY

B.Sc. MLT: Three Year Six Months (6-Semester) CBCS Programme

Basic Structure: Distribution of Courses

S.No.	Type of Course	Total Courses	No. of courses	Credits	Credit Hours	Total Credit Hours	Total Credits
1	Core Course (CC)	8	8	4	32	32	32
2	Discipline Specific Course (DSC)	24	24	4	96	96	96
3	Discipline Specific Elective Course (DSEC)	1	1	3	3	3	3
4	Ability-Enhancement Compulsory Course (AECC)	3	3	9	9	9	9
5	Skill-Enhancement Elective Course (SEC)	32	28	1	56	92	46
			2	6	24		
			2	3	12		
6	Open Elective Course (OEC)	1	1	3	3	3	3
7	Indian Knowledge System (IKS)	1	1	2	2	4	2
	Total	70	70	-	-	239	191

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Choice Based Credit System (CBCS)

Choice Based Credit System (CBCS) is a versatile and flexible option for each student to achieve his target number of credits as specified by the UGC and adopted by our University.

The following is the course module designed for the BMLT program:

Core Course (CC): Core courses of MLT program will provide a holistic approach to health care education, giving students an overview of the field, a basis to build and specialize upon. These core courses are the strong foundation to establish health related knowledge and provide broad multi-disciplined knowledge can be studied further in depth during the elective phase. The core courses will provide more practical-based knowledge, case-based lessons and collaborative learning models. It will train the students to analyze, decide, and lead-rather than merely know-while creating a common student experience that can foster deep understanding, develop decision-making ability and contribute to the business and community at large. We offer ten core courses from I-VI semester. Each CC ranges from 2-3credits.

Ability Enhancement Compulsory Course (AECC): As per the guidelines of Choice Based Credit System (CBCS) for all Universities, including the private Universities, the Ability Enhancement Compulsory Course (AECC) is a course designed to develop the ability of students in communication (especially English) and other related courses where they might find it difficult to communicate at a higher level in their prospective job at a later stage due to lack of practice and exposure in the language, etc. Students are motivated to learn the theories, fundamentals and tools of communication which can help them develop and sustain in the corporate environment and culture. We offer three AECCs courses from I

–III semester of the program. Each AECC ranges from 2-4 credits.

Program/Discipline Specific Elective Course (DSEC): The discipline specific elective course is chosen to make students specialist or having specialized knowledge of a specific domain like marketing, human resource, etc. It is covered in III and VI semester of the program relevant to chosen disciplines of core courses of the program. The student will have to choose any one out of two. This course ranges from 2-3 credits including theory and practical.

Open Elective Course (OEC): Open Elective is an interdisciplinary additional subject that is compulsory in the IV and V semester of a program. The score of Open Elective is counted in your overall aggregate marks under Choice Based Credit System (CBCS). Open elective courses are of 3 credits in sem IV and V. Student should select any one open elective course from the pool of courses provided by the university.

Skill Enhancement Course (SEC): These courses are designed to provide value-based and/or skill-based knowledge. We offer thirty-five SECs from I-VI Semester. Each SEC ranges from 1-3 credits.

Value Added Course (VAC): A value added course is a non-credit course which is basically meant to enhance general ability of students in areas like soft skills, quantitative aptitude and reasoning ability - required for the overall development of a student and at the same time crucial for industry/corporate demands and requirements. The student possessing these skills will definitely develop acumen to perform well during the recruitment process of any premier

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organization and will have the desired confidence to face the interview. There shall be one course in each year, however, it will be compulsory for every student to pass these courses with minimum 75% attendance to be eligible for the certificate.

Indian knowledge system (IKS): - **IKS (Indian knowledge system):** -India has a rich tradition of intellectual inquiry and textual heritage that goes back several thousands of years. India was advanced in knowledge systems, traditions, and practices since antiquity. The whole range of knowledge systems is multifarious, from the Vedas, and Upanishads to scriptural, philosophical, scientific, technological and artistic sources. The disciplines and domains of knowledge include logic, philosophy, language, technology and crafts, polity, economics and governance, ethics and sociological orders, architecture and engineering, pure sciences, earth sciences, bio sciences, poetics and aesthetics, law and justice, grammar, mathematics and astronomy, metrics, agriculture, mining, metallurgy, trade and commerce, Ayurveda and yoga, medicine and life sciences, geography, military science, weaponry, shipbuilding, navigation and maritime traditions, biology and veterinary science etc.

Pedagogy & Unique practices adopted: "Pedagogy is the method and practice of teaching, especially for teaching an academic subject or theoretical concept". In addition to conventional time-tested lecture method, the institute will **emphasize on experiential learning.**

1. ***Case Based Learning*:** Case based learning enhances student skills at delineating the critical decision dilemmas faced by organizations, helps in applying concepts, principles and analytical skills to solve the delineated problems and velops effective templates for health related problem solving. Case method of teaching is used as a critical learning tool for effective learning and we encourage it to the fullest.

2. ***Role Play & Simulation:*** Role-play and simulation are forms of experiential learning. Learners take on different roles, assuming a profile of a character or personality, and interact and participate in diverse and complex learning settings. Role-play and simulation function as learning tools for teams and groups or individuals as they "play" online or face-to-face. They alter the power ratios in teaching and learning relationships between students and educators, as students learn through their explorations and the viewpoints of the character or personality they are articulating in the environment. This student-centered space can enable learner-oriented assessment, where the design of the task is created for active student learning. Therefore, role-play& simulation exercises such as virtual share trading, marketing simulation etc. are being promoted for the practical-based experiential learning of our students.

3. ***Video Based Learning (VBL) & Learning through Movies (LTM):*** These days' technology has taken a front seat and classrooms are well equipped with equipment and gadgets. Video-based learning has become an indispensable part of learning. Similarly, students can learn various concepts through movies. In fact, many teachers give examples from movies during their discourses. Making students learn few important theoretical concepts through VBL & LTM is a good idea and method. The learning becomes really interesting and easy as videos add life to concepts and make the learning engaging and effective. Therefore, our institute is promoting VBL & LTM, wherever possible.

4. ***Field / Live Projects*:** The students, who take up experiential projects in different hospitals/health organizations, where senior executives with a stake in teaching guide them, drive the learning. All students are encouraged to do some live project other their regular classes.

5. ***Industrial Visits/ Educational tour:*** Industrial visit are essential to give students hands-on exposure and experience of how things and processes work in education. College organizes such visits to enhance students' exposure to practical learning and work out for a report of such a visit relating to their specific topic, course or even domain.

6. ***MOOCS:*** Students may earn extra credits by passing MOOCS as decided by the college from time to time. Students may earn pre-requisite credits and certificate through MOOC.

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7. Special Guest Lectures (SGL): Some topics/concepts need extra attention and efforts as they either may be high in difficulty level or requires experts from specific health organizations/domain to make things/concepts clear for a better understanding from the perspective of the health care system. Hence, to cater to the present needs of industry we organize such lectures, as part of lecture-series and invite prominent personalities from academia and health organizations from time to time to deliver their vital inputs and insights

8. Student Development Programs (SDP): Harnessing and developing the right talent for the right organizations an overall development of a student is required. Apart from the curriculum teaching various student development programs (training programs) relating to soft skills, interview skills, workshops etc. that may be required as per the need of the student and healthcare trends, are conducted across the whole program. Participation in such programs is solicited through volunteering and consensus.

9. Special assistance Programme for slow learners: Special classes are arranged for slow learners. They are assisted patiently and consistently. Motivation is one of the most essential requirements to help them continue learning. Proper acknowledgement and praise helps the overall development of such student.

10. Laboratory Focused programs: Establishing collaborations with various health partners to deliver the Programme on sharing basis. The specific courses are to be delivered by health care experts to provide practice based insight to the students.

11. Orientation program: Two week Programme is arranged to introduce students to college services which will support their educational and personal goals. To facilitate initial academic process, course selection and registration, creating an atmosphere that minimizes anxiety, promotes positive attitude and stimulates excitement for learning. It also helps knowledge of scope, information regarding academic and student service resources and Programme. It provides a welcoming atmosphere for students to meet faculty, staff, senior students as well as other new students.

12. Mentoring scheme: The College follows the mentoring scheme. Every student is provided with a faculty mentor to help him/her in their personal & academic issues. The mentor maintains a register along with the mentor mentee booklet provided to all students. In that book all the details of student are filled and every month 2 times they meet with their mentor. Mentor fills the details of meeting in every student's register and tries to solve the issue and after solving the issue the issue closed in that register.

13. Career & personal counseling: College has training and placement cell for career and personal counseling of the students.

14. Competitive exam preparation: College provides different subject experts for competitive exam preparation of students.

15. Extracurricular Activities: organizing & participation of students in extracurricular activities are mandatory to help students and develop confidence & face audience with care.

16. Participation in workshop, seminars, writing & presenting paper: College encourages students to take participate in these types of activities. Most of our students are participating in these types of activities.

17. Formation of Student clubs, membership & organizing and participating events: College have students club and students are participating in many events like youth festival and other activities those are performed in our Universities as well as in other Universities participation.

18. Capability enhancement & development scheme: College offers some schemes like soft skill development, remedial

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coaching, yoga and meditation and personal counseling to enhance the capability and holistic development of the students.

19. Library visit & Utilization of E-Learning resources: College as well as faculty members encourage students to go to library and study. To enhance this department, have provision of Library schedule in the time table so student can use that time to refer different books and use E learn in library. College have well developed and organized library.

(Celeste Bhalwagen) (T. Sethi (Tabassum)) (Nidhi Singh & Manisha Saxena) (Dr. Pradnya)

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Study & Evaluation Scheme

B.Sc. MLT- Semester-I

S.N	Category	Course Code	Course	Periods			Creditt	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	CC-1	14157	Human Anatomy-I	4	-	-	4	30	70	100
2	CC-2	14158	Human Physiology-I	4	-	-	4	30	70	100
3	DSC-1	14159	Principle of Biochemistry-I	4	-	-	4	30	70	100
4	DSC-2	14160	Basic Microbiology-I	4	-	-	4	30	70	100
5	DSC-3	14161	Basic Pathology-I	4	-	-	4	30	70	100
6	AECC-1	14055	Basic computer and information science	3	-		3	20	30	50
7	SEC-1	14719	LAB: Human Anatomy-I	-	-	2	1	15	35	50
8	SEC-2	14720	LAB: Human Physiology-I	-	-	2	1	15	35	50
9	SEC-3	14721	LAB: Principle of Biochemistry-	-	-	2	1	15	35	50
10	SEC-4	14722	LAB: Basic Pathology-I	-	-	2	1	15	35	50
11	SEC-5	14723	LAB: Basic Microbiology-I	-	-	2	1	15	35	50
			Total	**23**	**0**	**10**	**28**	**245**	**555**	**800**

(Dr. P. Kanojia)

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Study & Evaluation Scheme

B.Sc. MLT -Semester II

S.N	Category	Course Code	Course	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	CC-3	14162	Human Anatomy-II	4	-	-	4	30	70	100
2	CC-4	14163	Human Physiology-II	4	-	-	4	30	70	100
3	DSC-4	14164	Principles of Biochemistry-II	4	-	-	4	30	70	100
4	DSC-5	14165	Basic Microbiology-II	4	-	-	4	30	70	100
5	DSC-6	14166	Basic Pathology-II	4	-	-	4	30	70	100
6	IKS		Ancient Indian wisdom	2	-	-	2	20	30	50
7	AECC-2	14061	English Communication and soft skill	3	-	-	3	20	30	50
8	SEC -6	14724	Lab;Human Anatomy -II	-	-	2	1	15	35	50
9	SEC-7	14725	LAB: Human Physiology- II	-	-	2	1	15	35	50
	SEC-8	14726	LAB:Principles of Biochemistry-II	-	-	2	1	15	35	50
10	SEC-9	14727	LAB: Basic Microbiology-II	-	-	2	1	15	35	50
11	SEC-10	14728	LAB: Basic Pathology-II	-	-	2	1	15	35	50
Total				25	00	10	30	265	585	85

(Sangita Bhatnagar) (Jagveer Singh) (Shishir Singh) (Manisha Saxena)

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Study & Evaluation Scheme

B.Sc. MLT –Semester III

S. N	Category	Course Code	Course	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	DSC-7	14168	Applied Clinical Biochemistry-I	4		-	4	30	70	100
2	DSEC-1		Basic & Clinical Pharmacology	3			3	30	70	100
3	DSC-8	14169	Systemic Bacteriology	4		-	4	30	70	100
4	DSC-9	14170	Basic of Haematological Diseases-I	4		-	4	30	70	100
5	DSC-10	14171	Fundamental of Histopathology	4		-	4	30	70	100
6	CC-5	14067	Introduction of quality and patient safety	4		-	4	20	30	50
7	SEC-11	14730	LAB: Applied clinical Biochemistry -I	-	-	2	1	15	35	50
8	SEC-12	14731	LAB: Systemic Bacteriology	-	-	2	1	15	35	50
9	SEC-13	14732	LAB:Basic of Haematological Diseases-	-	-	2	1	15	35	50
10	SEC-14	14733	LAB: Fundamental of Histopathology	-	-	2	1	15	35	50
11	SEC-15		Clinical Training	-	-	6	3			
Total				**23**	**5**	**14**	**30**	**230**	**520**	**750**

(Dr. Ramesh Bhatnagar) (T. Sahay) (Nidhi Singh) Manisha Manishasaxena (Dr. P. Saxena)

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Study & Evaluation Scheme

B.Sc. MLT –Semester IV

S.N	Category	Course Code	Course	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	DSC-11	14172	Applied Clinical Biochemistry-II	4	-	-	4	30	70	100
2	DSC-12	14173	Applied Bacteriology	4	-	-	4	30	70	100
3	DSC-13	14174	Medical Parasitology & Entomology	4	-	-	4	30	70	100
4	DSC-14	14175	Basics of Haematological Diseases-II	4	-	-	4	30	70	100
5	DSC-15	14176	Cytopathology & Cytotechniques	4	-		4	30	70	100
6	CC-6	14073	Basic Preventive Medicine and Community Health Care	3	-	-	3	20	30	50
7	SEC-16	14734	LAB: Applied Clinical Biochemistry-II	-	-	2	1	15	35	50
8	SEC-17	14735	LAB: Applied Bacteriology	-	-	2	1	15	35	50
9	SEC-18	14735	LAB: Medical Parasitology & Entomology	-	-	2	1	15	35	50
10	SEC-19	14736	LAB: Basics of Haematological Diseases-II	-	-	2	1	15	35	50
11	SEC-20	14737	LAB: Cytopathology & Cytotechniques	-	-	2	1	15	35	50
12	SEC-21		Clinical Training	-	-	6	3			
			Open Elective	-	-	-	3	As per University guidelines		
Total				23	0	16	34	245	555	800

(Dr. Ramesh Bhatnagar) (T. Fatima) Nidhi Singh Manisha Saxena (Dr. P. Kamboj)

FACULTY OF PARAMEDICAL SCIENCES ASHIANA Principal BAREILLY

Study & Evaluation Scheme

B.Sc. MLT -Semester V

S. N	Category	Course Code	Course	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	DSC-16	14177	Analytical Biochemistry	4	-	-	4	30	70	100
2	DSC-17	14178	Immunology & Bacterial Serology	4	-	-	4	30	70	100
3	CC-7	14179	Principle of Laboratory Management	4	-	-	4	30	70	100
4	DSC-18	14180	Blood Banking & Genetics	4	-	-	4	30	70	100
5	DSC-19	14181	Applied Histopathology-I	4			4	30	70	100
6	DSC-20	14079	Research Methodology & Bio statistics	3		-	3	20	30	50
7	SEC-22	14739	Analytical Biochemistry LAB	-	-	2	1	15	35	50
8	SEC-23	14740	Immunology & Bacterial Serology LAB	-	-	2	1	15	35	50
9	SEC-24	14741	Principle of Laboratory Management LAB	-	-	2	1	15	35	50
10	SEC-25	14742	Blood Banking & Genetics LAB	-	-	2	1	15	35	50
11	SEC-26	14743	Applied Histopathology-I LAB	-	-	2	1	15	35	50
12	SEC-27		CLINICAL POSTING			12	6			
		Total		**23**	**0**	**22**	**34**	**245**	**555**	**800**

Principal

Study & Evaluation Scheme

B.Sc. MLT -Semester VI

S. N	Category	Course Code	Course	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	CC-8	14182	Clinical Endocrinology& Toxicology	4	-	-	4	30	70	100
2	DSC-21	14183	Medical Mycology & Clinical Virology	4	-	-	4	30	70	100
3	DSC-22	14184	Immuno pathology & Molecular Biology	4	-	-	4	30	70	100
4	DSC-23	14185	Applied Haematology	4	-	-	4	30	70	100
5	DSC-24	14186	Applied Histopathology-II	4	-	-	4	30	70	100
6	AECC-3	14085	Environmental Sciences	3	-	-	3	20	30	50
7	SEC-28	14744	LAB: Clinical Endocrinology &Toxicology	-	-	2	1	15	35	50
8	SEC-29	14745	LAB:Medical Mycology & Clinical Virology	-	-	2	1	15	35	50
9	SEC-29	14746	LAB:Immuno pathology & Molecular Biology	-	-	2	1	15	35	50
10	SEC-30	14747	LAB: Applied Haematology	-	-	2	1	15	35	50
11	SEC-31	14748	LAB:Applied Histopathology-II	-	-	2	1	15	35	50
12	SEC-32		CLINICAL POSTING			12	6	-	-	-
	-		-	**23**	**0**	**22**	**34**	**245**	**555**	**800**

Note: *DSEC courses are to be selected from the list of courses offered.

(Sakshi Bhatnagar) (T. Fatima) (Nidhi Singh) (Manisha Saxena)

Dr. P. Agarwal

FACULTY OF PARAMEDICAL SCIENCE Principal BAREILLY

*DISCIPLINE SPECIFIC ELECTIVE COURSES OFFERED (DSEC)

S.NO.	Semester	Course Code	Course Name	L	T	P	Credit
1	III		General Pathology	3	-	-	3
2			Basic & Clinical Pharmacology				
3			Advance Diagnostic Techniques	3	-	-	3
4			Diagnostic Molecular Biology				

Internship Time Period

Internship for Qualifying B.Sc. MLT Programme will be of six months. Minimum 720 hours of internship should be completed by the candidate to be awarded the degree.

(Dr. Pramoj Jain)

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New

Course Code: 14157	Core Course -1 (CC-1) BMLT- Semester-I Human Anatomy-I	L-4 T-0 P-2 C-5
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	Describing different terminology and recognizing organs, organ system	
CO2.	Understanding the major structures of human body.	
CO3.	Differentiating the various organ system and its related disorders	
CO4.	Explaining various organ systems and employ knowledge of human anatomy to solve questions regarding functions, diseases and sample collection	
CO5.	Analyzing appropriate sample collection site	
Course Content:		45 Hours
Unit-1:	Terminology and General Plane of the Body, Body Parts and Areas, Terms of Location and Position, Body Cavities and Their Membranes, Dorsal cavity, Ventral cavity, Planes and Sections	9 Hours
Unit-2:	Cells: Structure, function and location, Prokaryotic and eukaryotic cells, Cell organelles, Cell division Tissue, Types, Structure, Location and Function of Epithelial Tissue, Connective Tissue, Muscle Tissue, Nerve Tissue, Membranes, Glandular tissue The Integumentary System: structure and function of The Skin, Subcutaneous Tissue	9 Hours
Unit-3:	Musculoskeletal System: Basic anatomy of bones, Axial, Appendicular Skeleton, Classification of Bones, Joints, Classification of Joints, Name of the muscles of body. Cardiovascular syestem Heart-size,location,chambers exterior&interior Blood supply of Heart,Systemic and Pulmonary circulation Conductive system of heart .Brief introduction about Lymphatic System	9Hours
Unit-4:	Respiratory system: Basic anatomy of nose, larynx, trachea, bronchi and lungs	9 Hours
Unit-5:	Digestive system: basic anatomy of esophagus, stomach, small intestine, large intestine, liver, gall bladder, pancreas	9Hours
Text Books:	*1. Text Book of Physiology, Sujit Chaudhary*	
Reference Books:	*1. Anatomy & Physiology, Ross & Wilson* *2. Human Anatomy, B D Chaurasia* *3. https://open.umn.edu/opentextbooks/textbooks/169* *4. https://www.classcentral.com/course/humanphysio-380*	

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(B.Sc. MLT)-First Semester

Human Anatomy-I

Unit-I

Introduction: human body as a whole:

Definition of anatomy and its divisions. Terms of location, positions and planes.

Cell and its organelles: Epithelium-definition, classification, describe with examples, function Glands-classification, des;cribe serous & mucous glands with examples. Basic tissues- classification with examples.

Unit- II

Locomotion and support:

Cartilage- types with examples & histology

Bone- Classification, names of bones cells, parts of long bone, microscopy of compact bone, names of all bones, vertebral column, intervertebral disc, fontanelles of fetal skull

Joints- Classification of joints with examples, synovial joint (in detail for radiology)

Muscular system: Classification of muscular tissue & histology. Names of muscles of the body

Unit-III

Cardiovascular system:

Heart-size, location, chambers, exterior & interior, Blood supply of heart

Systemic & pulmonary circulation: Branches of aorta, common carotid artery, subclavian artery, axillary artery, brachial artery, superficial palmar arch, femoral artery, internal iliac artery, Peripheral pulse. Inferior venacava, portal vein, portosystemic anastomosis.Great saphenous vein, Dural venous sinuses

Lymphatic system – cistern chili & thoracic duct, Histology of lymphatic tissues, Names of regional lymphatics, Axillary and inguinal lymph nodes in brief.

Unit-IV

Nervous system:

Neuron, Classification of Nervous System, Cerebrum, cerebellum midbrain, pons, medulla oblongata, spinal cord nerve (gross & histology), Meninges, Ventricles & cerebrospinal fluid, Names of basal nuclei, Blood supply of brain, Cranial nerves, Sympathetic trunk & names of parasympathetic ganglia.

Unit-V

Endocrine glands:

Names of all endocrine glands in detail on pituitary gland, thyroid gland, parathyroid gland, suprarenal gland – (gross & histology).

Unit-VI

Urinary system:

Kidney, ureter, urinary bladder, male and female urethra, Histology of kidney, ureter and urinary bladder.

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New

Course Code: 14158	Core Course -2 (CC-2) BMLT- Semester-I Human Physiology-I	L-4 T-0 P-2 C-5
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	Understanding the function & structure of cells, tissues and major human organs system/parts.	
CO2.	Understanding physiological processes accurately and using relevant scientific terminology and nomenclature.	
CO3.	Understanding physiological processes accurately and using relevant scientific terminology and nomenclature.	
CO4.	Explaining the interrelation between different organ systems to maintain biological equilibrium	
CO5.	Classifying functions of various organ systems and employ itsknowledge to understand diseases	
CO6.	Applying various experimental techniques related to physiology	
Course Content:		45 Hours
Unit-1:	Cell physiology: Structure, membrane, transport across cell membrane, Active, Passive, Organization of the Body, Body Composition, Body Fluid Volumes and its measurement, Diffusion, Osmosis, Tonicity, Homeostasis	9 Hours
Unit-2:	Blood-composition, function, cellular component & their function, hemoglobin & anemia, blood groups and coagulation Lymphatic system-Composition & function of lymph, lymphatic tissue, Immunity with the role of thymus	9 Hours
Unit-3:	Cardiovascular system-general arrange, heart, arteries, veins and capillaries, heart structure and function, cardiac cycle, heart sounds, heart rate, blood pressure, mechanism of circulation, definition of hypertension & shock	9Hours
Unit-4:	Respiratory system: parts of respiratory system, mechanism of respiration, pulmonary function, pulmonary circulation, lungs volume, Gas transport between lungs and tissues, Definition of hypoxia, dyspnea, cyanosis, asphyxia and obstructive airways diseases	9 Hours
Unit-5:	Gastrointestinal physiology: Organs of GIT and their structure & function, secretion, digestion, absorption and assimilation, gastrointestinal hormones, physiology of digestion of carbohydrates, proteins & lipids, Structure & function of liver, spleen, gallbladder & pancreas, Jaundice, Cirrhosis & Pancreatitis.	9Hours
Text Books:	*Text Book of Physiology, Sujit Chaudhary*	
Reference Books:	*Anatomy & Physiology, Ross & Wilson* *Human Anatomy, B D Chaurasia* *https://open.umn.edu/opentextbooks/textbooks/169* *https://www.classcentral.com/course/humanphysio-380*	

FACULTY OF PARAMEDICAL SCIENCES BAREILLY

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BAREILLY INTERNATIONAL UNIVERSITY

Course: B.Sc. MLT Ist Semester
Human Physiology-I

Unit-I

Introduction – composition and function of blood.

Red blood cells – Erythropoiesis, stages of differentiation, function, count, physiological variation. Haemoglobin & Methods of Estimation of Hb. White blood cells – Production, concentration, types, albumin, globulin, fibrinogen, Prothrombin functions: Haemostasis& blood coagulation. Haemostasis, clotting factors, mechanism of clotting, disorders of clotting factors.

Blood Bank: Blood groups – ABO system, Rh system, Blood grouping & typing. Cross matching. Rh system: Rh factor, Rh in compatibility. Blood transfusion: indication, universal donor and recipient concept. Selection criteria of a blood donor. Transfusion reactions anticoagulants – Classification, example sand uses.

Anaemias: Classification: morphological and etiological effects of anaemia on body

Unit-II

Cardiovascular system

Heart – Physiological Anatomy, Nerve supply, Properties of Cardiac muscle. Cardiac cycle-systole, diastole, intraventricular pressure nerve. Cardiac Output – only definition. Heart sound, Normal heart sound, Areas of auscultation. Blood Pressure – Definition, normal value, clinical measurement of blood pressure, Physiological variations, regulation of heart rate, cardiac shock, hypotension, hypertension. Pulse – Jugalar, radial pulse, Triple response. Heart sounds – Normal heart sounds, cause characteristics and signification, Heart rate Electrocardiogram (ECG) – significance.

Unit-III

Respiratory System.

Functions of Respiratory system, Physiological Anatomy of Respiratory system, Respiratory tract, Respiratory Muscles, Respiratory organ-lungs, Alveoli, Respiratory membrane, stages of respiration. Mechanism of normal and rigorous respiration, Forces and favoring expansion of the lungs, intra pulmonary pleural pressure, surface tension, recoil tendency of the wall.

Transportation of Respiratory gases: Transportation of Oxygen: Direction, pressure gradient, Forms of transportation, Oxygenation of Hb, Quantity of oxygen transported. Lung volumes and capacities: Regulation of respiration What? Why? How? Mechanisms of Regulation,

Satish (Satish Bhatnagar)
(Dr. Nikki Mohan)
Dr. Nikki Mohan
Pramod Kumar
(Dr. Pramod Kumar)
(Dr. P. Kannaf)

nervous and chemical regulation, Respiratory centre. Hearing Reflexes. Applied Physiology and Respiratory : Hypoxia, Cyanosis, Asphyxia, Dyspnea, Dysbarism, Artificial Respiratory, Apnoea.

Unit-IV

Endocrine System:

Definition Classification of Endocrine glands & their Hormones

Properties of Hormones. Thyroid gland hormone – Physiological, Anatomy, Hormones secreted, Physiological function, regulation of secretion.Disorders – hypo and hyper secretion of hormone of adrenal gland, Adrenal cortex, physiologic anatomy of adrenal gland,

Adrenal cortex, cortical hormones – functions and regulation. Adrenal medulla- Hormones, regulation and secretion, functions of adrenaline and nor adrenaline. Pituitary hormones – Anterior and posterior pituitary hormones, secretion, function. Pancreas- Hormones of pancreas. Insulin – secretion, regulation, function and action.

Diabetes mellitus – Regulation of blood glucose level.Parathyroid gland – Function, action, regulation of secretion of parathyroid hormone. Calcification – function and action.

Unit- V

Excretory system:

Kidney: functions of kidneys, structural and functional unit nephron, vasa recta, cortical and juxtamedullary nephrons – Comparison, Juxta Glomerular Apparatus –structure and function, renal circulation peculiarities.

Mechanism of Urine formation: Ultrafiltration criteria for filtration GFR, Plasma fraction, EFP, factors effecting GFR, Determination of GFR selective reabsorption – sites of reabsorption, substance reabsorbed, mechanisms of reabsorption Glucose, urea.

H+Cl amino acids etc. TMG, Tubular lead, Renal threshold % of reabsorption of different substances, selective secretion. Properties and composition of normal urine, urine output.Abnormal constituents in urine, mechanims of urine concentration. Counter Current Mechanisms: micturition, innervation of bladder, cysteurethrogram.

Diuretics: Water, Diuretics, osmotic diuretics, artificial kidney, Renal function tests – plasma clearance, Actions of ADH, Aldosterone and PTH on kidneys. Renal function tests.

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Course Code: 14161	Discipline Specific Course -3 (DSC-3) BMLT- Semester-I **Basic Pathology-I**	L-4 T-0 P-2 C-5
Course Outcomes:	On completion of the course, the students will be :	
CO1.	Understanding the formation of blood & its composition.	
CO2.	Describing different stage of cells development.	
CO3.	Understanding the concept of Haemopoiesis, biomedical waste management, & microscopy	
CO4.	Applying the specific technique for sample collection, its preservation & biomedical waste management.	
CO5.	Analyzing infected blood samples and sites for hematological investigations	
Course Content:		45 Hours
Unit-1:	**Introduction to pathology:** Definition , Types of Laboratory, History of pathology Laboratory organization, general laboratorysafety measures.	9 Hours
Unit-2:	**Instruments and glass wares used in hematology.** Introduction, types, composition, workingPrinciple, used, maintenance , merit and demerits	9 Hours
Unit-3:	**Sample collection and Anticoagulants** Methods of collection, sample labeling, preparation, storage, transport, handling and disposal. Anticoagulants – mechanism of action, composition, merits, demerits, uses, changes taking place inblood on storage EDTA, heparin fluoride, ACD, CPDA, double oxalate, sodium citrate.	9 Hours
Unit-4:	**Blood**: Formation, composition, functions, normal values and physiological variation of cellularconstituents. **Romanowsky stains & Solutions** Types, composition preparation of stains, function of individual constituents. Normality molarity,solutions and buffers used in hematology.	9 Hours
Unit-5:	**Haemoglobin** Struecture and function, synthesis, types, breakdown. Various methods, sources of errors, remedies,standardization of methods and instruments, merits and demerits of various methods. **Haemocytometry;**General introduction of Hemocytometer , Diluting fluids, Errors, precautions to be taken in Totalleukocyte count, RBC count, Platelet count, Absolute Eosinophil count.	9Hours
Text Books:	1. *Text book of Medical lab Technology, Praful B Godkar, IIIrd edition* 2. *Text book of Medical Lab Technology, Ramnik Sood, Jaypee Publishers*	
Reference Books:	1. *Medical Lab Technology by K.L. Mukherjee,* 2. *Practical Haematology,Dacie & Lewis, 11th edition* 3. *De gruchy's Clinical Hematology in Medical Practice* 1. *https://www.hematology.org/education* 2. *https://www.vet.cornell.edu/animal-health-diagnostic-center/laboratories/clinical-pathology*	

(Sangita Bhatnagar) (Nidhi Singh) (Dr. P. Ramnayak) (Dr Nitesh Mohan)

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New

Course Code: 14159	Discipline Specific Course -2 (DSC-1) BMLT- Semester-I **Principle of Biochemistry-I**	L-4 T-0 P-2 C-5
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	Understanding the role and responsibilities of medical lab technologist	
CO2.	Understanding principle, working and maintenance of various laboratory instruments	
CO3.	Understanding different types of solutions and their preparations	
CO4.	Applying appropriate methods for collection, handling and processing of different body fluids	
CO5.	Analyzing body fluids on the basis of physical, chemical and microscopic examinations	
Course Content:		**45 HOURS**
Unit-1:	**Introduction to biochemistry**: Scope of biochemistry Cell and its biochemical organization. Introduction to Fundamental and Clinical Biochemistry, First aid in laboratory accidents.Principle,working,care& maintenance of Weighing balance, Hot plate, centrifuges, incubator, hot air oven, colorimeter, spectro photometer, pH meter.	**8 Hours**
Unit-2:	**.Carbohydrates** • Definition, classification with examples, chemical properties • Monosaccharides - Structure of glucose, fructose, andgalactose • Disaccharides - structure of maltose, lactose, andsucrose • Polysaccharides - chemical nature of starch andglycogen	**8 Hours**
Unit-3:	**.Lipids** • Definition, classification with examples • Structure and properties of triglycerides (oils and fats) • Fatty acid classification - Based on chemical and nutritional requirements with examples • Structure and functions of cholesterol in the body • Lipoproteins - types, composition and functions in thebody	**8 Hours**
Unit-4:	**Proteins** • Definition, classification of proteins based on composition and solubility with examples • Definition, classification of amino acids based on chemical nature and nutritional requirements withexamples • Structure of proteins (four levels of organization of protein structure) Diseases related to malnutrition of proteins.	**8 Hours**

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UNIT-5;	**Nucleic acids** • Definition, purine and pyrimidine bases • Components of nucleosides and nucleotides with examples • Structure of DNA (Watson and Crick model), RNA and their functions	8 HOURS
Text Books:	*1. Text book of Biochemistry, D M Vasudevan,Jaypee Publishers*	
Reference Books:	*1. Practical Biochemistry, Singh & Sahni* *2. Biochemistry, Voet & Voet, 4th edition, John Wiley & sons* *3. Biochemistry, U Satyanarayan* *1. https://www.elsevier.com/books/essentials-of-medical-biochemistry/bhagavan/978-0-12-416687-5* *2. https://iubmb.onlinelibrary.wiley.com/journal/15393429*	

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Course: B.Sc. MLT Ist Semester
Principle of Biochemistry-I

Unit-I

Introduction to Bio-chemistry including code of ethics for Medical lab technicians and Medical Lab Organisation.

Unit- II

Glassware and plastic ware used in a bio-chemical laboratory

Glass ware: Types of glass and composition. Types of glassware used their identification, application and uses. Cleaning, drying, maintenance and storage of glassware. Plastic ware: Brief outline.

Unit-III

Instrumental methods of bio-chemical analysis:

Colorimetry: Visual and photoelectric methods, instrumentation, principles and laws involved, construction, operation, care and maintenance, applications.

Spectrophometry: Principle and theory, types, construction, and applications.

Flame photometry: Principle and theory, types, construction, and application.

Unit-IV

Collection of specimens

I. Blood: Types of Specimens, Collection, Precautions during collection, Processing and preservation.

II. Urine: Types of specimens, Collection of 24 hours urine and preservation

Unit- V

Solution: Types based on solute and solvent, Types based on method of expressing concentration, Calculations

Unit-VI

Carbohydrates and lipids: Carbohydrates: Definition, Biological importance, Classification, Acid value, Iodine value, Saponification value.

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Course Code: 14160	Discipline Specific Course -2(DSC-2) BMLT- Semester-I Basic Microbiology-I	L-4 T-0 P-2 C-5
Course Outcomes:	On completion of the course, the students will be :	
CO1.	Understanding theories and concepts of microorganisms.	
CO2.	Understanding microscope, its components and maintenance	
CO3.	Describing the morphology of eukaryotic and prokaryotic cells	
CO4.	Applying microscopy to study basic features of microorganisms	
CO5.	Analyzing different stains and staining techniques	45 Hours
Course Content:		
Unit-1:	Historical introduction to Microbiology contribution of famous scientist in the filed of Microbiologyin brief. Anatomy Van Lee wen Hook, Robert Koch, Edward Jenner, Louis Pasteur, Joseph Lister	9 Hours
Unit-2:	**Microscopes** Principle working and maintenance of compound microscope. Principle of Fluorescent Microscope,Electron Microscope, Dark Ground Microscope.	9 Hours
Unit-3:	**Definition,** classification and methods of sterilization Principle and method of sterilization by heat. By Dry Heat, Flaming, Red Heat, Hot air oven,incineration By Merit Heat-pasteurization, Inspissations, Tyndalisation, Autoclave Filtration Methods: Ionizing Radiation-Disinfection, Mode of action and uses of important chemical disinfection-Phenol and Phenolic compounds, alcohols, halogens, dyes and acids and alkalis. Gaseous Methods of sterilization.	9 Hours
Unit-4:	Cleaning, drying & Sterilization of Glassware disposal of contaminated material i.e. clinical infectivematerial inoculated culture media, Handling and Disposal of Biomedical waste.	9 Hours
Unit-5:	**Equipments used in microbiology** General instruments. Microbiological : autoclave, incubator, Hot air oven, Laminar air flow, Refrigerator inoculators, Mac intoshfield's Jar. Other instruments: Electrophoresis, Chromatography ELISA, RIA, Etc.	9 Hours
Text Books:	*1. Ananthanarayan R. and Paniker C.K.J. (2009) Textbook of Microbiology. 8th edition, University Press Publication*	
Reference Books:	*1. Goering R., Dockrell H., Zuckerman M. and WakelinD. (2007) Mims' Medical Microbiology. 4th edition. Elsevier* *2. Willey JM, Sherwood LM, and Woolverton CJ. (2013)* *1. http://www.ppup.ac.in/e-Content/_edetails.php?id=2017* *2. http://ecoursesonline.iasri.res.in/course/view.php?id=108*	

Course Code: 14055	Ability Enhancement Compulsory Course -1 (AECC-1)BMLT- Semester-I Basic Computers and Information Sciences	L-3 T-0 P-0 C-3
Course Outcomes:	On completion of the course, the students will be :	
CO1.	Understanding the fundamentals and history of computer	
CO2.	Understanding the concept of Computer's Memory Management andprocessing	
CO3.	Understanding and applying the basic functions on document sheet, Spread sheet and presentation slide	
CO4.	Understanding the concept of Internet, Web and Websites	
	Course Content	30Hours
Unit-1:	Introduction to computer: Introduction, characteristics of computer, block diagram of computer, generations of computer, computer languages. Input output devices: Input devices(keyboard, point and draw devices, data scanning devices, digitizer, electronic card reader, voice recognition devices, vision-input devices), output devices(monitors, pointers, plotters, screen image projector, voice response systems).	6 Hours
Unit-2:	Processor and memory: The Central Processing Unit (CPU), main memory. Storage Devices: Sequential and direct access devices, magnetic tape, magnetic disk, optical disk, mass storage devices.	6 Hours
Unit-3:	Introduction of windows: History, features, desktop, taskbar, icons on the desktop, operation with folder, creating shortcuts, operation with windows (opening, closing, moving, resizing, minimizing and maximizing, etc.). Introduction to MS-Word: introduction, components of a word window, creating, opening and inserting files, editing a document file, page setting and formatting the text, saving the document, spell checking, printing the document file, creating and editing of table, mail merge.	6 Hours
Unit-4:	Introduction to Excel: introduction, about worksheet, entering information, saving workbooks and formatting, printing the worksheet, creating graphs. Introduction to power-point: introduction, creating and manipulating presentation, views, formatting and enhancing text, slide with graphs. Introduction of Operating System: introduction, operating system concepts, types of operating system Computer networks: introduction, types of network (LAN, MAN, WAN, Internet, Intranet), network topologies (star, ring, bus, mesh, tree, hybrid), components of network.	6 Hours
Unit-5:	Internet and its Applications: definition, brief history, basic services (E-Mail, File Transfer Protocol, telnet, the World Wide Web (WWW)), www browsers, use of the internet. Application of Computers in clinical settings.	6 Hours

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Text Books:	1. *Sinha P.K., Computer Fundamentals, BPB Publishing.* 2. *Bill Bruck., The Essentials Office 2000 Book, BPBPublishing.* 3. *Leon A. & Leon M., Introductions to Computers, Vikas Publications*	
Reference Books:	1. *Peter Norton_s, Introductions to Computers, Tata McGrawHill.* 2. *Price Michael, Office in Easy Steps, TMHPublication.*	

Note: Course Outcomes of following practicals are covered in their respective theory courses

Course Code: 14719	Skill Enhancement Course-1 (SEC-1) BMLT- Semester-I Lab: Human Anatomy-I	P-2 C-1
Course Content:		
1.	Demonstration of normal anatomical position ,plane, relation .body cavities & movements from models.	
2.	To study of compound Microscope&and its parts.	
3.	Microscopic study of various types of tissues Epithelial,Connective tissue, Muscular tissue,Nervous tissue	
4.	Identification of axial bones	
5.	Identification of appendicular bones	
6.	Demonstration of parts of circulatory system from models.	
7.	Demonstration of parts of respiratory system from models.	
8.	Demonstration of digestive system from models.	
9.	Demonstration of structural differences between skeletal, smooth and cardiac muscles.	
10.	Demonstration of various joints	

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Course Code: 14720	Skill Enhancement Course-2 (SEC-2) BMLT- Semester-I LAB: Human Physiology-I	P-2 C-1
Course Content:		
1.	To measure pulse rate	
2.	To measure blood pressure	
3.	Demonstration of ECG	
4.	To perform Hemoglobin by Sahli's Method	
5.	To perform Hemoglobin by CMG method.	
6.	To Estimate ESR	
7.	To perform Total RBC count.	
8.	To perform total leucocyte count.	
9.	To perform differential leucocyte count.	
10.	To perform PCV	
11.	To calculate Red cell indices.	
12-	Lungs volume and capacities ,Spirometry	
Course Code: 14722	Skill Enhancement Course-4 (SEC-4) BMLT- Semester-I LAB: Basic Pathology-I	P-2 C-1
Course Content:		
1.	Preparation of anticoagulant for various biochemical & hematological investigation.	
2.	Preparation of stains (Leishman's stain, giemsa) & buffer solution.	
3.	Estimation of hemoglobin by Sahli's Method.	
4.	Estimation of hemoglobin by Cynmethaemoglobin Method	
5.	Total Erythrocyte count by hemocytometer.	
6.	Platelet count by hemocytometry	
7.	Platelet count by hemocytometry	
8.	Absolute Eosinophil Count	

Course Code: 14721	Skill Enhancement Course-3 (SEC-3) BMLT- Semester-I LAB: **Principles of Biochemistry-I**	P-2 C-1
Course Content:		
1.	Introduction and preparation of different types of solutions- Normal, Molar, Molar, %, g/l and mole fraction.	
2.	Preparation of 0.1 M Phosphate buffer of pH 7.2.	
3.	Determination of absorption maxima (λmax) of a Bromo-phenol blue.	
4.	Qualitative tests on carbohydrates to identify the nature of given sample.	
5.	Quantitative estimation of Total carbohydrate in given sample by Anthroone method.	
6.	Quantitative estimation of reducing sugar by 3',5'-Dinitrosalicylic acid (DNSA) method.	
7.	Quantitative estimation of proteins (viz. Folin-Phenol-Lowry method, Bradford method / UV method)	
8.	Quantitative estimation of nucleic acids by Diphenylamine (DPA) method	
9.	Determination of acid value of a given fat sample	
10.	Separation of amino acids by paper chromatography	

Course Code: 14723	Skill Enhancement Course-5 (SEC-5) BMLT- Semester-I LAB: Basic Microbiology-I	P-2 C-1
Course Content:		
1.	Laboratory visit ,Sample Collections,Smear preparation	
2.	To demonstrate glassware used in microbiology.	
3.	To demonstrate working and handling of Microscope.	
4.	To demonstrate method of sterilization by autoclave.	
5.	To demonstrate method of sterilization by Hot air oven.	
6.	To perform Gram staining	
7.	To perform Acid fast staining (Zeihl Neelsen staining)	
8.	To perform Indian ink staining	
9.	To perform Albert's staining	

BAREILLY INTERNATIONAL UNIVERSITY, BAREILLY
FACULTY OF PARAMEDICAL SCIENCES

BACHELOR OF PHYSIOTHERAPY (BPT)

[Applicable w.e.f. Academic Session 2023-24]

[As per CBCS guidelines given by UGC]

Rohilkhand Medical College Campus, Pilibhit by Pass Road, Bareilly. (U.P) – 243006 INDIA
Phone:- 0581-2526011, 2526012 (EPABX) Fax: 2526054, 2303345
E-mail: info@rmcbareilly.com, www.rmcbareilly.com

BAREILLY INTERNATIONAL UNIVERSITY

Study & Evaluation Scheme	
SUMMARY	
Institute Name	*Faculty of paramedical sciences*
Program	*Bachelor of Physiotherapy (BPT)*
Duration	*Four and half years (Nine Semesters) including Six Months Internship*
Medium	*English*
Minimum Required Attendance	*75%*
Credits	
Credits Required for Degree	197 *(*Maximum one Discipline Specific Elective Course/MOOC can be audit course per semester per programme)*

Assessment			
Evaluation	**Internal**	**External**	**Total**
Theory	30	70	100
PRACTICAL	15	35	50



(Sakshi Bhalwaga) (T. Fatima) (Siddhi Srivastava) (Manisha Saxena) (Dr. P. Kanojia)

Program Structure-BPT

Introduction: Rehabilitation is an integral part of patient return to community setup following a visit to the hospital or clinic. Physical rehabilitation aimed at the holistic treatment and management of the patient is crucial to patient re-integration into the society. BPT students are to be proficient and able members of the healthcare team that can perform in various hospital, field and clinical settings. The students must be able to interact and communicate with the patients, their caretakers and members of the healthcare team. The BPT curriculum is aimed at making physiotherapists that are efficient practitioners with proper skills for management of common conditions.

The institute emphasis on the following courses ***balanced with core and elective courses:*** The curriculum of BPT program is based on a practical, skill- based education with 75 credits of core courses, 64 credits of discipline specific courses, 57 credits of skill enhancement courses, 6 credits of ability enhancement compulsory courses, 6 credits of generic electives, 4 credits of research project report, 8 credits of discipline specific elective courses and 2 credits of Indian knowledge system. Out of maximum 205 credits, 197 credits are required to obtain the BPT degree.

Course handouts for students will be provided in every course. A course handout is a thorough teaching plan of a faculty taking up a course. It is a blueprint which will guide the students about the pedagogical tools being used at different stages of the syllabus coverage and more specifically the topic-wise complete plan of course, that is, how the faculty members treat each and every topic from the syllabus and what they want the student to do, as an extra effort, for creating an effective learning. It may be a case study, a role-play, a classroom exercise, an assignment- home or field, or anything else which is relevant and which can enhance their learning about that particular concept or topic. Due to limited availability of time, most relevant topics will have this kind of method in course handout.

BPT: Four years (8 semester) CBCS Program

Basic Structure: Distribution of Courses

S. No.	Type of Course	Total Courses	No. of Courses	Credits	Credit Hours	Total Credit Hours	Tot Cred
1	Core Course (CC)	20	12	04	48	75	75
			05	03	15		
			02	05	10		
			01	02	02		
2	Discipline Specific Course (DSC)	17	04	03	12	64	64
			13	04	52		
3	Ability-Enhancement Compulsory Course (AECC)	3	2	3	06	08	08
			1	2	02		
4	Skill Enhancement Course (SEC)	30	08	01	14	114	57
			16	02	64		
			6	03	36		
5	Open/Generic Elective Course (GEC)	2	02	03	06	06	06
6	Research Project Report (RPR)	2	02	02	04	04	04
7	Discipline Specific Elective Course (DSEC)/ MOOC	2	01	04	04	08	08
8	Indian Knowledge System (IKS)	1	1	2	2	02	02
TOTAL		77	-	-	-	281	22

(T. Falling) (Nidhi Singh) (Manisha Saxena) (Dr. P. Kanungja)

(Sanjeli Rathaur)



Choice Based Credit System (CBCS)

Choice Based Credit System (CBCS) is a versatile and flexible option for each student to achieve his target number of credits as specified by the UGC and adopted by our university.

The following is the course module designed for the BPT program:

Core Course (CC): A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course. Core courses of BPT program will provide a holistic approach to physiotherapy education, giving students an overview of the field, a basis to build and specialize upon. The core courses will provide more practical-based knowledge, and collaborative learning models. It will train the students to analyze, decide, and formulate the holistic rehabilitation program for an individual depending on the specific needs. A wide range of core courses provides groundwork in the basic physiotherapy disciplines: Human Anatomy, Human Physiology, Surgery etc. We offer core courses in 8 semesters during the BPT program. There will be 75 credits in all for core courses offered.

Ability Enhancement Compulsory Course (AECC): As per the guidelines of Choice Based Credit System (CBCS) for all Universities, including the private Universities, the Ability Enhancement Compulsory Course (AECC) is a course designed to develop the ability of students in communication (especially English) and other related courses where they might find it difficult to communicate at a higher level in their prospective job at a later stage due to lack of practice and exposure in the language, etc. Students are motivated to learn the theories, fundamentals and tools of communication which can help them develop and sustain in the medical environment and culture. In all AECC will be of 8 credits.

Skill Enhancement Course (SEC): This course is designed to provide skill-based knowledge. In all SEC will carry 57 credits.

Discipline Specific Course (DSC): The discipline specific course is chosen to make students specialist or having specialized knowledge of specific domains of Physiotherapy like Electro therapy , Exercise therapy, PTin Orthopaedics etc. It will be covered in all the 8 semesters of the program. DSC will carry 64 credits.

Open/Generic Elective Course (GEC): Open/Generic Elective is an interdisciplinary additional subject that is compulsory in the 5th and 7th semester of the program. The score of Generic Elective is counted in the overall aggregate marks under Choice Based Credit System (CBCS). Each Generic Elective paper will be of 6 Credits and students will have the choice of taking 2 GE's: 1 each in 5th and 7th semester. Each student has to take Open/Generic Electives from department other than the parent department. Core / Discipline Specific Electives will not be offered as Generic Electives.

Value Added Course (VAC): A value added course is a non-credit course provided to the students outside the syllabus which is basically meant to enhance general ability of students in areas like soft skills quantitative aptitude and reasoning ability - required for the overall development of a student and at the same time crucial for industry/corporate demands and requirements. The Value-added Courses are aimed to be provided to the students within and across university. The student possessing these skills will definitely develop acumen to perform well during the recruitment process of any premier organization and will have the desired confidence to face the interview. Moreover, these skills are also essential in day- to-day life of the medical world. The aim is to nurture every student for making effective communication, developing aptitude and a general

(Sanjit Bhatnagar) (T. Fatima) (Monisha Saxena) (Dr. P. Kanungo)

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reasoning ability for a better performance, as desired in medical world. There shall be pool of courses offered by the Department each in 8 semesters and will carry no credit, however, it will be compulsory for every student to pass these courses with minimum 45% marks to be eligible for the certificate. These marks will not be included in the calculation of CGPI.

Discipline Specific Elective Course (DSEC): The discipline specific elective course is chosen to make students have specialized knowledge of a specific domain. It will be covered in 6th and the 8th semester of the program. Each student will have to choose two discipline specific elective courses (DSECs) as offered by any credible medical portal, one in 6th semester and other in 8th semester respectively from the given set of courses identified by the Department at the start of each session. DSEC will carry 8 credits. However, these will be the audit courses where the failing the course would not affect the eligibility for obtaining the degree.

Research Project Report (RPR): In addition to learning Research theory there will be mandatory group research project with maximum of 10 students in each group, which will provide hands on experience in contrast to theory in health care settings. It will be assessed internally and the 4 credits will be earned.

Indian Knowledge System (IKS): India has a rich tradition of intellectual inquiry and textual heritage that goes back several thousands of years. India was advanced in knowledge systems, traditions, and practices since antiquity. This course is designed to provide tradition-based knowledge. IKS will carry 02 credits.

Internship Posting (IP): Each student will undergo for 6 months compulsory internship at the end of the program.

(Manisha Saxena) (Dr. B. Ramanjaneyulu)

SHANTI Principal

Program Outcomes (POs):

On completion of the program, the students will be:

PROGRAM OUTCOMES	
PO1	Acquiring knowledge of fundamental principles, tools & techniques and their applications in the field of Physical therapy.
PO2	Developing in-depth critical and analytical thinking in order to identify, formulate and implement Physiotherapy care plan.
PO3	Utilizing soft skills, communication skills and concepts of ethics.
PO4	Demonstrating team spirit, empathetic social concern, leadership and environment sensitivity for local and national healthcare needs.
PO5	Creating ability to engage in evidence-based innovation, decision-making, entrepreneurship skills and life-long learning.

Program Specific Outcomes (PSOs)

On completion of the program, the students will be:

PROGRAM SPECIFIC OUTCOMES	
PSO1	Understanding the basic concepts of physical therapy related to medical sciences, biomechanics, therapeutic exercises, modalities, special techniques, first aid, patient psychology, nutritional science and social setup.
PSO2	Understanding the concept of research methodology and biostatistics and its application to enhance new knowledge in the field of physiotherapy and uphold Evidence Based Practice.
PSO3	Understanding the concept of health, epidemiology, healthcare programs, role of NGOs and community-based rehabilitation.
PSO4	Applying the concepts to work efficiently and ethically in professional environment and be able to use computers for research and clinical work.
PSO5	Applying evidence-based rehabilitation strategies used in the field of Orthopaedics, Neurological Sciences, Cardiorespiratory, Sports and others.
PSO6	Applying the skills to efficiently manage emergency health situations.
PSO7	Creating a plan to execute theoretical knowledge in clinical settings for autonomous physiotherapy practice.

Satish Bhatnagar) (T. Fatma) Nidhi Singh, Manisha Saxena) (D. P. Sammoja)

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Pedagogy & Unique practices adopted: "Pedagogy is the method and practice of teaching, especially for teaching an academic subject or theoretical concept". In addition to conventional time-tested lecture method, the institute will **emphasize on experiential learning.**

Induction and orientation program: A fifteen-day program by professionals and experts is conducted for the 1st and 2nd semester students on a variety of topics like time management, presentation, professionalism, knowledge building and stress coping amongst others. The program is aimed at preparing students for the upcoming semesters, to practice theoretical concepts, logical thinking, reasoning and evaluation skills in clinical setups

Theory to practical application in Clinical Postings: Patient assessment, physical examination, provisional diagnosis and physiotherapeutic treatment are an integral part of physiotherapy practice. The technique to apply the theoretical knowledge onto patients in a hospital setting helps in developing critical and analytical thinking, practical and decision-making skills. Students utilize the concepts, principles and techniques for patient evaluation and management in the pre-final and final semesters in real- life settings of hospital.

Demonstration Labs: Well-equipped demonstration labs help the students learn in a stress-free environment, where-in demonstration on fellow models is carried out for familiarity with the theoretical concepts. Learning focused on practice and feasibility of modalities and exercises is encouraged. Practical sessions regarding the use of patient assessment, modalities, exercises and other treatment techniques creates a knowledge base for the students and provides them an overview of patient setup in hospitals.

Student seminars and case presentations: Enhancement of communication and practical skills, participation, group discussion and healthy discussion between professionals is promoted among students and with teachers. The case/ topic knowledge, presentation skills, audience interaction and ability to answer queries are the skills promoted by this practice.

Project work: Groups of students of the final semester make research-based projects, wherein they learn skills pertaining to team work, leadership, research methodology, recent advances of physical therapy and research critique. Evidence Based capability in knowledge acquiring and use are promoted. Analytical thinking and decision-making skills are used for the project work and to arrive at a comprehensive research conclusion. Students submit an internship project at the end of the internship program based on their choice and hospital requirements.

Educational tours: Potential of future internship and work are explored by visits to prospective cities. Students can decide the institute of choice based on future plans, goals and feasibility.

Workshops, conferences and Guest lectures: Educational and motivational content and talks delivered by multiple experts from various fields and professions to inculcate concepts, skills, techniques and research advances among students. Students learn and practice the acquired knowledge and interact with professionals and specialists for overall education and learning experience.

Extra-curricular and co-curricular activities: Regularly scheduled cultural, sports and academic activities promote student mental health, relieve stress and provide a platform for display of extra- curricular and co-curricular skills and creativity. Competitions aimed at promoting team work, leadership qualities and innovation help in the holistic development of young adults into professionals.

(Tutors) (Manisha Saxena) (Dr. Priyanka Jha)

FACULTY OF PARAMEDICAL SCIENCES ★ BAREILLY ★

Student Development Programs (SDP): Harnessing and developing the right talent for the right industry an overall development of a student is required. Apart from the curriculum teaching various student development programs (training programs) relating to soft skills, interview skills, SAP, Advanced excel training etc. that may be required as per the need of the student and industry trends, are conducted across the whole program. Participation in such programs is solicited through volunteering and consensus.

Industry Focused programs: Establishing collaborations with various industry partners to deliver the program on sharing basis. The specific courses are to be delivered by industry experts to provide practice-based insight to the students.

Library and E-content: Students are encouraged to use the resources at library as well as that available in E-Library extensively. The students are motivated to use authentic web- based platforms to do study work.

Role Play & Simulation: Role-play and simulation are forms of experiential learning. Learners take on different roles, assuming a profile of a character or personality, and interact and participate in diverse and complex learning settings. Role-play and simulation function as learning tools for teams and groups or individuals as they "play" online or face-to-face. They alter the power ratios in teaching and learning relationships between students and educators, as students learn through their explorations and the viewpoints of the character or personality they are articulating in the environment. This student-centered space can enable learner-oriented assessment, where the design of the task is created for active student learning.

Video Based Learning (VBL) & Learning through Movies (LTM): These days technology has taken a front seat and classrooms are well equipped with equipment and gadgets. Video-based learning has become an indispensable part of learning. Making students learn few important theoretical concepts through VBL & LTM is a good idea and method. The learning becomes really interesting and easy as videos add life to concepts and make the learning engaging and effective. Therefore, our institute is promoting VBL & LTM, wherever possible.

Internship program: Apart from the 8 semester' s program, the University also provides the students a choice to complete the six-month internship from the University hospital and physiotherapy outpatient department. Student exposure of patients from nearby urban as well as rural areas improves capability, learning, skills and management skills.

Special assistance program for slow learners & fast learners: The slow as well as the fast learners are identified on the basis of the individual performance in the class tests. Special classes or assignments are undertaken to cater to their respective needs. Fast learners are given special tasks to stimulate their abilities and make the maximum utilization as well as up gradation of their clinical skills.

Mentoring and Counseling: Every student shall be provided with a faculty mentor to help him/her in their personal and academic issues. The mentor maintains a mentorship handbook of all his/her mentees with complete personal and parent details. It is essential to meet at least once in a month. The mentor enters the discussions held, advice given and efforts & improvements made by the mentee. This handbook must be counter signed by the HOD once a month.

(Satish Bhalerao) (T. Fatima) (Nidhi Singh) (Manisha Saxena) (Dr. P. Somaiya)

FACULTY OF PARAMEDICAL SCIENCE ASHANT Principal BAREILLY

Bachelor of Physiotherapy
1ST SEMESTER

S. No	Type	Course Code	Course	Periods			Credits	Evaluation Scheme		Total
				L	T	P		Internal	External	
1.	CC-1	14125	Human Anatomy-I	5	-	-	5	30	70	100
2.	CC-2	14126	Human Physiology-I	5	-	-	5	30	70	100
3.	CC-3	14127	Biochemistry-I	4	-	-	4	30	70	100
4.	DSC-1	14128	General &Clinical Psychology	4	-	-	4	30	70	100
5.	AECC- 1	14006	Basic computer&information science	3	-	-	3	20	30	50
6.	AECC-2	14005	English Communication and soft skill	3	-	-	3	20	30	50
7.	SEC-1	14701	Human Anatomy-I (Lab)	-	-	4	2	15	35	50
8.	SEC-2	14702	Human Physiology-I (Lab)	-	-	4	2	15	35	50
9.	SEC-3	14703	Biochemistry-I (Lab)	-	-	2	1	15	35	50
			TOTAL	24	0	10	29	205	445	650

Note:			
L- Lecture	T- Tutorial	P- Practical	C- Credits
1C = 1 Hour L or T 1C = 2 Hour P			

FACULTY OF PARAMEDICAL SCIENCE HANT Principal BAREILLY

Bachelor of Physiotherapy
2nd SEMESTER

S. No	Type	Course Code	Course	Periods			Credits	Evaluation Scheme		Total
				L	T	P		Internal	External	
1.	CC-4	14129	Human Anatomy-II	4	-	-	4	30	70	100
2.	CC-5	14130	Human Physiology-II	4	-	-	4	30	70	100
3.	CC-6		Biochemistry-II	4	-	-	4	30	70	100
4.	DSC-2		Fundamentals of Exercise Therapy-I	3	-	-	3	30	70	100
5.	DSC-3		Electro therapy-I	3	-	-	3	30	70	100
6.	CC-7	14132	Sociology	3	-	-	3	30	70	100
7.	IKS-1		Yoga and Meditation	1	-	2	2	20	30	50
8.	SEC-4	14704	Human Anatomy-II (Lab)	-	-	4	2	15	35	50
9.	SEC-5	14705	Human Physiology-II (Lab)	-	-	2	1	15	35	50
10.	SEC-6		Biochemistry-II (Lab)	-	-	2	1	15	35	50
11.	SEC-7		Fundamentals of Exercise Therapy-I (Lab)	-	-	2	1	15	35	50
12.	SEC-8		Electrotherapy-I (Lab)	-	-	2	1	15	35	50
			TOTAL	22	0	14	29	275	625	900

Bachelor of Physiotherapy
3rd SEMESTER

S. No.	Type	Course code	Course	Periods			Credits	Evaluation Scheme		Total
				L	T	P	C	Internal	External	
1.	DSC-4		Exercise Therapy-I	4	-	-	4	30	70	100
2.	DSC-5		Electrotherapy-II	4	-	-	4	30	70	100
3.	DSC-6		Biomechanics And Kinesiology -I	4	-	-	4	30	70	100
4.	CC-8		Pathology	3	-	-	3	30	70	100
5.	SEC-9		Exercise Therapy -I(Lab)	-	-	4	2	15	35	50
6.	SEC-10		Electrotherapy-II (Lab)	-	-	4	2	15	35	50
7.	SEC-11		Biomechanics And Kinesiology-I (Lab)	-	-	4	2	15	35	50
8.	SEC-12		Clinical Posting I	-	-	6	3	50	50	100
TOTAL				15	0	18	24	215	435	650

FACULTY OF PARAMEDICAL SCIENCE ASHANT Principal BAREILLY

Bachelor of Physiotherapy
4th SEMESTER

S. No.	Type	Course code	Course	Periods			Credits	Evaluation Scheme		Total
				L	T	P	C	Internal	External	
1.	DSC-7		Exercise Therapy-II	4	-	-	4	30	70	100
2.	DSC-8		Biomechanics And Kinesiology -II	4	-	-	4	30	70	100
3.	CC-9		Microbiology	3	-	-	3	30	70	100
4.	CC-10		Pharmacology	3	-	-	3	30	70	100
6.	SEC-13		Exercise Therapy-II (Lab)	-	-	4	2	15	35	50
7.	SEC-14		Biomechanics And Kinesiology -II (Lab)	-	-	4	2	15	35	50
8.	SEC-15		Clinical Education-II	-	-	6	3	50	50	100
TOTAL				15	0	16	23	180	400	600

Bachelor of Physiotherapy
5th SEMESTER

S. No.	Type	Course code	Course	Periods			Credits	Evaluation Scheme		Total
				L	T	P	C	Internal	External	
1.	CC-11		Medicine-I	4	-	-	4	30	70	100
2.	CC-12		Clinical Orthopaedics-I	4	-	-	4	30	70	100
3.	CC-13		Clinical Neurology-I	4	-	-	4	30	70	100
4.	CC-14		Research Methodology and Biostatistics	2	-	-	2	30	70	100
5.	CC-15		Surgery-I	4	-	-	4	30	70	100
6.	DSC-9		Physical Diagnosis And Manipulative Skills-I	3	-	-	3	30	70	100
7.	SEC-16		Development Of Self for Senior Healthcare Professionals	1	-	-	1	30	70	100
8.	SEC-17		Physical Diagnosis and Manipulative Skills-I (Lab)	-	-	4	2	15	35	50
9.	SEC-18		Supervised Clinical Training	-	-	6	3	15	35	50
10.	GEC-1	-	Open Elective-1	3	-	-	3			100
TOTAL				25	0	10	30	240	560	900

(Sakshi Bhatnagar) (T. Fatima) (Nidhi Singh) (Manisha Saxena) (Dr. P. Kanungo)

FACULTY OF PARAMEDICAL SCIENCES ASHIANT

Bachelor of Physiotherapy
6TH SEMESTER

S. No.	Type	Course code	Course	Periods			Credits	Evaluation Scheme		Total
				L	T	P	C	Internal	External	
1.	CC-16		Medicine-II	4	-	-	4	30	70	100
2.	CC-17		Clinical Orthopaedics-II	4	-	-	4	30	70	100
3.	CC-18		Clinical Neurology-II	4	-	-	4	30	70	100
4.	CC-19		Community Medicine	3	-	-	3	30	70	100
5.	CC-20		Surgery-II	4	-	-	4	30	70	100
6.	DSC-10		Physical Diagnosis And Manipulative Skills-II	3	-	-	3	30	70	100
7.	SEC-19		Workplace Effectiveness for Senior Healthcare Professionals	1	-	-	1	30	70	100
8.	SEC-20		Physical Diagnosis And Manipulative Skills-II (Lab)	-	-	4	2	15	35	50
9.	DSEC-1 (MOOC)		Allied Health Essentials-I	4	-	-	4	15	35	50
10.	SEC-21		Supervised Clinical Training	-	-	6	3	50	50	100
TOTAL				27	-	10	32	290	610	900

SCHOOL OF PARAMEDICAL SCIENCES SHIATS Principal BAREILLY

Bachelor of Physiotherapy
7th SEMESTER

S. No.	Type	Course code	Course	Periods			Credits	Evaluation Scheme		Total
				L	T	P	C	Internal	External	
1.	DSC-11		Physiotherapy In Orthopaedic Conditions-I	4	-	-	4	30	70	100
	DSC-12		Physiotherapy In NeurologicalConditions-I	4			4	30	70	100
2.	DSC-13		Physiotherapy In Sports	4	-	-	4	30	70	100
3.	DSC-14		Community Based Rehabilitation	4	-	-	4	30	70	100
4.	SEC-22		Physiotherapy In Orthopaedic Conditions (Lab)	-	-	4	2	15	35	50
	SEC-23		Physiotherapy In NeurologicalConditions-I(Lab)	-	-	4	2	15	35	50
5.	SEC-24		Physiotherapy In Sports (Lab)	-	-	4	2	15	35	50
6.	SEC-25		Community Based Rehabilitation (Lab)	-	-	2	1	15	35	50
7.	RPR-1		Research Project-I	-	2	-	2	100	-	100
8.	SEC-26		Supervised Clinical Training	-	-	6	3	50	50	100
9.	GEC-2	-	Open Elective-2	3	-	-	3	40	60	100
TOTAL				19	2	20	31	370	530	900

(Sakshi Bhatia) (T. fatima) (Nidhi Singh) (Manisha) (Manisha saxena) (Dr. P. Ramya)

FACULTY OF PARAMEDICAL SHIATS

Bachelor of Physiotherapy
8th SEMESTER

S. No.	Type	Course code	Course	Periods			Credits	Evaluation Scheme		Total
				L	T	P	C	Internal	External	
1.	DSC-15		Physiotherapy In Neurological Conditions-II	4	-	-	4	30	70	100
	DSC-16		Physiotherapy In Orthopaedic Conditions-II	4			4	30	70	100
2.	DSC-17		Physiotherapy In Cardiorespiratory and General Conditions	4	-	-	4	30	70	100
	SEC-27		Physiotherapy In Orthopaedic Conditions-II(Lab)			4	2	15	35	50
3.	AECC-3		Medical Ethics and Evidence Based Practice	2	-	-	2	30	70	100
4.	SEC-28		Physiotherapy In Neurological Conditions-II (Lab)	-	-	4	2	15	35	50
5.	SEC-29		Physiotherapy In Cardiorespiratory and General Conditions (Lab)	-	-	4	2	15	35	50
6.	RPR-2		Research Project-II	-	2	-	2	100	-	100
7.	SEC-30		Supervised Clinical Training	-	-	6	3	50	50	100
8.	DSEC-2 (MOOC)		Allied Health Essentials -II	4	-	-	4	100	-	100
TOTAL				12	2	14	23	415	435	850

FACULTY OF PARAMEDICAL & ALLIED SCIENCES
PUNJABI UNIVERSITY PATIALA

New

Course Code: 14125	CORE COURSE-1 B.P.T 1st SEMESTER HUMAN ANATOMY-I	L-5 T-0 P-4 C-7
Course Outcomes:	On completion of the course, the students will be:	
CO1.	Understanding the human anatomical structures.	
CO2.	Analyzing general human anatomy.	
CO3.	Identifying and differentiating applied anatomy of soft tissues, hard tissues, joints	
Course Content:		Total Hours: 60
Unit-1:	**General Anatomy:** Introduction to Anatomy, terms and terminology. Regions of Body, Cavities and systems. Surface anatomy – musculoskeletal, vascular, cardiopulmonary system. General Embryology. Applied anatomy. **Osteology:** Upper Extremity, Lower Extremity, Trunk & Pelvic, Head & Neck Basic tissues of the body Definition,location and their function Structure and appendages of skin	10 Hours
Unit-2:	**Musculoskeletal system:** Connective tissue & its modification, tendons, membranes, special connective tissue. Bone structure, blood supply, growth, ossification, and classification. Muscle classification, structure and functional aspect. Joints – classification, structures of joints, movements, range, limiting factors, stability, blood supply, nerve supply, dislocations and applied anatomy.	10 Hours
Unit-3:	**Upper Extremity:** Bony architecture. Joints – structure, range of movement. Muscles – origin, insertion, actions, nerve supply. Major nerves – course, branches and implications of nerve injuries. Development of limb bones, muscles and anomalies. Radiographic identification of bone and joints. Applied anatomy	10 Hours
	Cardiovascular system Circulatory system – major arteries and veins of the body, structure of blood vessels, Heart size,shape,structure, positions, chambers, valves, internal & external features, Blood supply & nerve supply of heart, Blood vessels Arteries ,Veins, Capillaries Conductive system of heart **Lymphatic system** Anatomy of lympatic system, structure & functions. Lymph nodes	10 Hours
Unit-4:	**Digestive system** Parts of digestive system. Abdominal cavity – divisions. Muscles of abdominal wall.Location,size,shape,features,blood supply,nerve supply and function of Liver, Pancreas, Spleen, Alimentary canal, Gallbladder, Intestine (small & large)	10 Hours

FACULTY OF PARAMEDICAL SCIENCES SHANTS Principal BARELLY

Unit-5:	**Respiratory system** Outline of respiratory tract. Thorax: Pleural cavities & pleura, Lungs and respiratory tree, Position,parts,relation, blood supply,nerve supply of lungs & Diaphragm Intercostal muscles and accessory muscle of respiration; origin,insertion ,nerve supply&action **Endocrine system** Position,shape,size,function,blood supply,nerve supply of ;Pituitary glands,Thyroid glands,Parathyroid glands,Pancreas,Adrenal glands	**10 Hours**
Text Books:	1. *B.D Chaurasia Human Anatomy–Regional and Applied; Volume I, Volume II and Volume III* 2. *L. Williams & Warwick's, Gray's Anatomy - Churchill Livingstone* 3. *Inderbir Singh, Textbook of Anatomy with color atlas - Vol. 1,2,3 Jaypee Brothers* 4. *Cunningham Manual of Practical Anatomy Vol. 1,2,3, Churchill Livingstone*	
Reference Books:	1. *Snell [Richard S], Clinical Anatomy for Medical Students: Little Brown and Company Boston.1995.* 2. *Moorie [Kieth L], Clinically Oriented Anatomy. Ed.3.Williams Mcminn's Last's Anatomy-Regional and applied, Churchill Livingstone* ***Latest editions of all the suggested books are recommended.**	

FACULTY OF PARAMEDICAL SCIENCE PRINCIPAL BAREILLY

Course: BPT
I[st] Semester
Human Anatomy I

Total Hours : 90

Unit 1
Introduction to Anatomy, terms and terminology. Regions of Body, Cavities and systems. Surface anatomy – musculo-skeletal, vascular, cardiopulmonary system, General Embryology. Applied anatomy.

Unit 2
Musculoskeletal system.
Connective tissue & its modification, tendons, membranes, special connective tissue. Bone structure, blood supply, growth, ossification, and classification. Muscle classification, structure and functional aspect. Joints – classification, structures of joints, movements, range, limiting factors, stability, blood supply, nerve supply, dislocations and applied anatomy.

Unit 3
Upper extremity: Bony architecture Joints – structure, range of movement Muscles – origin, insertion, actions, nerve supply Major nerves – course, branches and implications of nerve injuries Development of limb bones, muscles and anomalies. Radiographic identification of bone and joints, Applied anatomy

Unit 4
Lower Extremity: Bony architecture Joints – structure, range of movement Muscles – origin, insertion, actions, nerve supply Major nerves – course, branches and implications of nerve injuries, Development of limb bones, muscles and anomalies, Radiographic identification of bone and joints, Applied anatomy

Unit 5
Cardiovascular system and Circulatory system – major arteries and veins of the body, structure of blood vessels, Heart structure, positions, chambers, valves, internal & external features, Blood supply to heart Conductive system of heart.

Unit 6
Endocrine system - Pituitary gland, Pineal gland, Thyroid gland, Parathyroid gland

FACULTY OF PARAMEDICAL SCIENCES BAREILLY ASSISTANT

New

Course Code: 14126	CORE COURSE- 2 B.P.T 1st SEMESTER HUMAN PHYSIOLOGY-I	L-5 T-0 P-4 C-7
Course Outcomes:	**On completion of the course, the students will be:**	
CO1.	Understanding the general physiology of the body.	
CO2.	Understanding normal functioning and interaction of all the organ systems.	
CO3.	Identifying applied physiology of various body systems.	
CO4.	Analyzing the response of various body systems to physiological and pathological stress.	
Course Content:		Total Hours: 60
Unit-1:	**General Physiology:** Cell: morphology, Structure and function of cell organelles. Structure of cell membrane. Transport across cell membrane. Intercellular communication. Homeostasis.	10 Hours
Unit-2:	**Blood:** Introduction-composition & function of blood. W.B.C., R.B.C., Platelets formation & functions, Immunity. Plasma: composition, formation & functions, Plasma Proteins: -types & functions. Blood Groups- types, significance, determination. Hemoglobin. Haemostasis. Lymph-composition, formation, circulation &functions	11 Hours
Unit-3:	**Cardiovascular System:** Conducting system-components, impulse conduction, Heart valves. Cardiac cycle- definition, phases of cardiac cycle. Cardiac output- definition, normal value, determinants. Stroke volume and its regulation. Heart rate and its regulation. Arterial pulse, Blood pressure-definition, normal values, factors affecting blood pressure. Shock-definition, classification, causes and features. Basic idea of ECG. Cardiovascular changes during exercise.	13 Hours
Unit-4:	**Respiratory System:** Mechanics of respiration. Lung volumes and capacities, transport of respiratory gases. Factors affecting respiration Regulation of respiration-neural regulation and chemical regulation. Hypoxia. Artificial respiration. Disorders of respiration- dyspnoea, orthopnoea, hyperpnoea, hyperventilation, apnoea, tachypnoea. Respiratory changes during exercise.	13 Hours

FACULTY OF PARAMEDICAL SCIENCE Principal SHANTI BAREILLY

(Manisha Sahu) (Dr. P. Kanojia)

Unit-5:	**Nerve Muscle Physiology** Muscles- classification, structure, properties, Excitation contraction coupling. Motor unit, factors affecting muscle tension, Muscle tone, fatigue, exercise. Nerve –structure and function of neurons, classification, properties. Resting membrane potential & Action potential their ionic basis, All or None phenomenon. Neuromuscular transmission. Ionic basis of nerve conduction. Concept of nerve injury & Wallerian degeneration. Synapses. Electrical events in postsynaptic neurons. Inhibition & facilitation at synapses, Chemical transmission of synaptic activity. Principal neurotransmitters, EMG.	**13 Hours**
Text Books:	*1. Sembulingum, K., Essentials of Medical Physiology, 4th edition, JP MedicalPub*	
Reference Books:	*2. Ganong, Review of Medical Physiology, Pub. McGraw Hill, 23rd Edition.* *3. Samson Wright's Applied Physiology, Thirteenth Edition (Oxford Medicine Publication)* *4. Guyton & Halls, Medical Physiology, 12th edition, Saunders Elsevier.* *5. Chatterjee, Human Physiology, Central BookAgency.* *** Latest editions of all the suggested books are recommended.**	

FACULTY OF PARAMEDICAL SCIENCES ASHANT Principal BAREILLY

Course: BPT
I[st] Semester
Human Physiology-I

Unit 1
General Physiology
Cell: morphology, Structure and function of cell organelles Structure of cell membrane Transport across cell membrane Intercellular communication Homeostasis

Unit 2
Blood
Introduction-composition & function of blood W.B.C., R.B.C., Platelets formation & functions, Immunity Plasma: composition, formation & functions, Plasma Proteins:-types & functions
Blood Groups- types , significance, determination Hemoglobin Haemostasis Lymph-composition, formation, circulation &functions

Unit 3
Cardiovascular system
Conducting system-components, impulse conduction Heart valves Cardiac cycle- definition, phases of cardiac cycle Cardiac output- definition, normal value, determinants. Stroke volume and its regulation Heart rate and its regulation Arterial pulse, Blood pressure-definition, normal values, factors affecting blood pressure Shock-definition, classification, causes and features
Basic idea of ECG Cardiovascular changes during exercise

Unit 4
Respiratory System: Mechanics of respiration Lung volumes and capacities Pulmonary circulation, transport of respiratory gases Factors affecting respiration Regulation of respiration-neural regulation, voluntary control and chemical regulation Hypoxia, Hypercapnoea, Hypocapnoea Artificial respiration Disorders of respiration- dyspnoea, orthopnoea, hyperpnoea, hyperventilation, apnoea, tachypnoea Respiratory changes during exercise.

Unit 5
Nervous system : Introduction, central and peripheral nervous system, functions of nervous system Reflexes- monosynaptic, polysynaptic, superficial, deep &withdrawal reflex Sense organ, receptors, electrical & chemical events in receptors Sensory pathways for touch, temperature, pain, proprioception & others Control of tone & posture: Motor mechanism: motor cortex, motor pathway: the descending tracts pyramidal & extra pyramidal tracts-origin, course, termination & functions. UMN & LMN paralysis.

Unit 6
Endocrinology : Physiology of the endocrine glands – Pituitary, Pineal Body, Thyroid, Parathyroid, Adrenal, Gonads, Thymus, Pancreas. Hormones secreted by these glands, their classifications and functions.

New

Course Code: 14127	CORE COURSE- 3 B.P.T 1st SEMESTER BIO-CHEMISTRY-I	L-4 T-0 P-2 C-5
Course Outcomes:	**On completion of the course, the students will be:**	
CO1.	Understanding the basic concepts and principles of Biochemistry.	
CO2.	Understanding macronutrients, micronutrients and role of enzymes	
CO3.	Applying the knowledge of biochemical processes for clinical diagnosis	
Course Content:		TotalHours 45
Unit-1:	**Introduction to biochemistry:** Scope of biochemistry ; Cell and its biochemical organization. Introduction to Fundamental and Clinical Biochemistry, First aid in laboratory accidents.Principle,working,care& maintenance of Weighing balance, Hot plate, centrifuges, incubator, hot air oven, colorimeter, spectro photometer, pH meter.	8 Hours
Unit-2:	**Carbohydrates** • Definition, classification with examples, chemicalproperties • Monosaccharides - Structure of glucose, fructose, andgalactose • Disaccharides - structure of maltose, lactose, andsucrose • Polysaccharides - chemical nature of starch andglycogen	8 Hours
Unit-3:	**.Lipids** • Definition, classification with examples • Structure and properties of triglycerides (oils and fats) • Fatty acid classification - Based on chemical and nutritional requirements with examples • Structure and functions of cholesterol in the body • Lipoproteins - types, composition and functions in thebody	8 Hours
Unit-4:	**Proteins** • Definition, classification of proteins based on composition and solubility with examples • Definition, classification of amino acids based on chemical nature and nutritional requirements withexamples • Structure of proteins (four levels of organization of protein structure) Diseases related to malnutrition of proteins.	8 Hours
Unit-5:	**Nucleic acids** • Definition, purine and pyrimidine bases • Components of nucleosides and nucleotides withexamples • Structure of DNA (Watson and Crick model), RNA and their functions	8 Hours

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Text Books:	1. *Murray [Robert Kk], Harper's Bio Chemistry Ed 24, Prentice Hall. 1996, p925,* 2. *Ramakrishna [S], Prasanna [Kg], Rajan [R], Text Book of Medical Biochemistry, Edl, Orient Langman, Bombay 1980.* 3. *Vasudevan [Dm] And SreeKumari [S], Text Book of Bio Chemistry for Medical* 4. *Students, Ed 1, Jaypee Brothers, New Delhi, 1995,p637.* 5. *Das [Debajyothi], Biochemistry, Ed. 7, Academic Publishers Calcutta,1992.* 6. *Prasad Rm, Rm's Physiotherapy Textbook Series, Text book of Biochemistry for Bachelor of PhysiotherapyFirst Edition, RM Publications, Mangalore.*	
Reference Books:	1. *Lehininger [albert] et. Al., principles of biochemistry, ed. 3, lbs publishers, delhi, 1993, p1143* 2. *Orten [james m] and neuhaus [oho.w]. Human biochemistry, ed. 9, mosby, st. louis,1975p994* 3. *Strayer [lubert], biochemistry, ed. 4, freeman & co., ny.1995, p1064.* 4. *Devlin [thomas m], biochemistry with clinical correalation, ed. 4, willey libs, ny1997, P1186.* *** Latest editions of all the suggested books are recommended.**	

FACULTY OF PARAMEDICAL SCIENCE
Principal
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Course: BPT
I[st] Semester
Biochemistry

Unit 1
Nutrition: Introduction, Composition of food, RDA, BMR, SDA, caloric requirement and Importance of nutrition Calorific values, Respiratory quotient, Physical activities (Energy expenditure), Role of carbohydrates, lipids and proteins in diet.Balanced diet and nutritional disorders.

Unit 2
Carbohydrates: Definition, classification, chemistry with examples, Structures, composition, sources, properties and functions of Monosaccharides, Disaccharides, Oligosaccharides and Polysaccharides. Glycosaminoglycan (mucopolysaccharides) metabolism (Glycogenesis, Glycogenolysis, Gluconeogenesis, Cori cycle), T.C.A cycle, glycolysis.

Unit 3
Lipids: Definition, classifications and general functions. Essential fatty acids and their importance, Metabolism- Oxidation of fatty acids, metabolism, oxidation of fatty acids, lipoproteins, Phospholipids, Cholesterol, lipolysis, lipogenesis, ketosis and ketone bodies metabolism.

Unit 4
Amino Acids; Definition, classification, essential and non essential aminoacids, metabolism (fate of ammonia) and urea cycle. Biological important pepetides, functions of proteins and amino acids.Enzymes : Definition, classification with examples, cofactors, Factors affecting enzyme action, isoenzyme and co-enzyme, Clinical importance of enzymes.

Unit 5
Biochemistry of connective tissue; Introduction, various connective tissue proteins: collagen, glycoproteins and proteoglycans, elastin- structure and associated disorders.
Vitamins: Definition, classification and functions, deficiency disorders, sources, RDA, digestion ,absorption, transport and toxicity of individual vitamins.

Unit 6
Clinical Biochemistry --; Relevance of blood and urine levels of Glucose, Urea, Uric acid, Calcium, Phosphates, Liver function tests, Renal function tests. Creatinine, pH and Bicarbonate. Lipid Profile-Tri -Glyceride, Cholesterol/HDL/LDL/ALDL Etc; Protein & Aggression, Glycosuria.
Nucleic acid:Function of DNA and RNA, chemistry, structure of DNA((Watson and Crick model),. Structure and functions of tRNA, rRNA, mRNA. Nucleotides and nucleosides.

Unit 7
Muscle Contraction - Contractile elements in muscle. Energy for muscle contraction
Biochemical harmones- Definition, Classification,Receptors, signal transduction, second messengers. Mechanism of Hormone action, effect of Insulin, Glucagon, Catecholamines, Thyroxine, Mineralocortocoids and Glucocorticoids. Diabetes mellitus: definition, types & causes.

Unit 8
Biochemical organization of Human Cell - Introduction, cell structure, Cell membrane structure and functions, Types of Absorption of mechanism, organelles and their functions, Cytoskeleton Minerals metabolism- definition, sources, RDA, digestion, absorption, transport, excretion, functions and disorders- Calcium, Phosphate, Iron Magnesium, Fluoride, Selenium, Molybdenum, Copper.Phosphate, Calcium and Iron in detail.

Unit 9
Acid base balance: Acid, base and buffers, Ph, Buffer System of The Body,Biocarbonate buffer system. Role of Lungs and kidneys in acid base balance, acid base imbalance. Water balance-Body water and its distribution, Regulation of water balance-Role of ADH and Thirst centre. Electrolyte Balance- Osmolarity, Role of Aldosterone, Renin-Angiotensin System and ANF.

Course Code: 14128	DISCIPLINE SPECIFIC COURSE-1 B. P.T 1st SEMESTER GENERAL AND CLINICAL PSYCHOLOGY	L-4 T-0 P-0 C-4	
Course Outcomes:	**On completion of the course, the students will be:**		
CO1.	Understanding the principles, theories and concepts of Human Psychology		
CO2.	Summarizing the concepts of abnormalities and diseases of human psychology		
CO3.	Perform psychosocial assessment of patientsin various developmental stages		
CO4.	Know about importance of psychologyin health delivery system		
Course Content:		Total Hours: 45	
Unit-1:	Introduction to Psychology.Schools: Structuralism, functionalism, behaviorism, Psychoanalysis. Methods: Introspection, observation, inventory and experimental method. Branches: pure psychology and applied psychology.Psychology and physiotherapy. Social psychology Leadership: Different types of leaders. Different theoretical approaches to leadership. Attitude: development of attitude. Change of attitude.	8 hours	
	Growth and Development. Life span: Different stages of development (Infancy, childhood, adolescence, adulthood, middle age, old age).Heredity and environment: role of heredity and environment in physical and psychological development, "Nature v/s Nurture controversy".	5 Hours	
Unit-2:	Sensation, attention and perception: Sensation: Vision, Hearing, Olfactory, Gustatory and Cutaneous sensation, movement, equilibrium and visceral sense. Attention: Types of attention, Determinants of attention (subjective determinants and objective determinants). Perception: Gestalt principles of organization of perception (principle of figure ground and principles of grouping), factors influencing perception (past experience and context). Illusion and hallucination: different types.	6 Hours	
	Motivation, Motivation cycle (need, drive, incentive, reward). Classification of motives.Abraham Maslow's theory of need hierarchy	4 Hours	
Unit - 3;	Frustration and conflict.Frustration: sources of frustration.Conflict: types of conflict. Management of frustration and conflict Emotions.Three levels of analysis of emotion (physiological level, subjective state, and overt behavior).Theories of emotion.Stress and management of stress. Intelligence.Theories of intelligence.Distribution of intelligence.Assessment of intelligence. Thinking.Reasoning: deductive and inductive reasoning.Problem solving: rules in problem solving (algorithm and heuristic).Creative thinking: steps in creative thinking, traits of creative people.	8 Hours	

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UNIT 4	Learning.Factors effecting learning.Theories of learning: trial and error learning, classical conditioning, Operant conditioning,insight learning, social learning theory.The effective ways to learn: Massed/Spaced, Whole/Part, Recitation/Reading, Serial/Free recall, Incidental/Intentional learning, Knowledge of results, association, organization, and mnemonic methods. Personality-Approaches to personality: type & trait, behavioristic, psychoanalytic and humanistic approach.Personality assessment: observation, situational test, questionnaire, rating scale, interview, and projective techniques. Defense Mechanisms: denial of reality, rationalization, projection, reaction formation, identification, repression, regression, intellectualization, undoing, introjection, acting out.	8hours	
Unit-5:	Clinical psychology – Models of training, abnormal behavior assessment, clinical judgement, psychotherapy, self-management methods, physiotherapist patient interaction, aggression, self-imaging, stress management, assertive training, Group therapy, Body awareness, Pediatric, child and geriatric clinical psychology.	6 Hours	
Text Books:	1 *Morgan C.T. & King R.A. Introduction to Psychology–7 edn. [Tata McGraw-Hill publication]* 2 *Mangal, S.K (2002).Advanced EducationalPsychology. New Delhi: Prentice Hall*		
Reference Books:			

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Course Code: 14006	ABILITY ENHANCEMENT COMPULSORY COURSE-1 B.P.T 1st SEMSETER BASIC COMPUTER AND INFORMATION SCIENCE	L-3 T-0 P-0 C-3
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	Understanding the fundamentals and history of computer	
CO2.	Understanding the concept of Computer's Memory Management andprocessing	
CO3.	Understanding and applying the basic functions on document sheet, Spread sheet and presentation slide	
CO4.	Understanding the concept of Internet, Web and Websites	
Course Content:		Total Hours: 45
Unit-1:	Introduction to computer: Introduction, characteristics of computer, block diagram of computer, generations of computer, computer languages. Input output devices: Input devices(keyboard, point and draw devices, data scanning devices, Digitizer , electronic card reader, voice recognition devices, vision-input devices), output devices(monitors, pointers, plotters, screen image projector, voice response systems).	7 Hours
Unit-2:	Processor and memory: The Central Processing Unit (CPU), main memory. Storage Devices: Sequential and direct access devices, magnetic tape, magnetic disk, optical disk, mass storage devices. Introduction of windows: History, features, desktop, taskbar, icons on the desktop, operation with folder, creating shortcuts, operation with windows (opening, closing, moving, resizing, minimizing and maximizing, etc.).	10 Hours
Unit-3:	Introduction to MS-Word: introduction, components of a word window, creating, opening and inserting files, editing a document file, page setting and formatting the text, saving the document, spell checking, printing the document file, creating and editing of table, mail merge. Introduction to Excel: introduction, about worksheet, entering information, saving workbooks and formatting, printing the worksheet, creating graphs.	10 Hours
Unit-4:	Introduction to power-point: introduction, creating and manipulating presentation, views, formatting and enhancing text, slide with graphs. Introduction of Operating System: introduction, operating system concepts, types of operating system.	10 Hours
Unit-5:	Computer networks: introduction, types of network (LAN, MAN, WAN, Internet, Intranet), network topologies (star, ring, bus, mesh, tree, hybrid), components of network. Internet and its Applications: definition, brief history, basic services (E-Mail, File Transfer Protocol, telnet, the World Wide Web (WWW)), www browsers, use of the internet. Application of Computers in clinical settings.	08 Hours
Text Books:	**1. Sinha P.K., Computer Fundamentals, BPB Publishing.**	
Reference Books:	1. Peter Norton's, Introductions to Computers, Tata McGraw Hill. 2. Price Michael, Office in Easy Steps, TMH Publication. 3. *Latest editions of all the suggested books are recommended.	

Course Code: 14005	ABILITY ENHANCEMENT COMPULSORY COURSE-2 B.P.T 1st SEMSETER ENGLISH COMMUNICATION AND SOFT SKILLS	L-3 T-0 P-0 C-3
Course Outcomes:	**On completion of the course, the students will be:**	
CO1.	Understanding the rules of functional grammar	
CO2.	Demonstrating effective speaking skills	
CO3.	Preparing essential written official communication	
CO4.	Demonstrating comprehension in listening and reading	
Course Content:		Total Hours: 30
Unit-1:	Basic Language Skills: Grammar and Usage. Business Communication Skills. With focus on speaking - Conversations, discussions, dialogues, short presentations, pronunciation.	6 Hours
Unit-2:	Teaching the different methods of writing like letters, E-mails, report, case study, collecting the patient data etc. Basic compositions, journals, with a focus on paragraph form and organization. Basic concepts & principles of good communication.	6 Hours
Unit-3:	Special characteristics of health communication, Types & process of communication verbal, non-verbal and written communication. Upward, downward and lateral communication.	6 Hours
Unit-4:	Therapeutic communication: empathy versus sympathy Communication methods for teaching and learning. Communication methods for patient education. Barriers of communication & how to overcome.	6 Hours
Text Books:	*1. English Grammar Composition and Usage by J.C. Nesfield, Macmillian Publishers.* *2 Communication Skills by Sanjay Kumar & PushpLata, Oxford University Press* *3 Business Writing for Dummies (3rd Edition) by Natalie Canavor, For Dummies* *4 Reading and Listening Comprehension Skills by Michelle Osment,* *5 Curriculum Concepts* *** Latest editions of all the suggested books are recommended.**	

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Course Code: 14701	**SKILL ENHANCEMENT COURSE-1** **B.P.T 1st SEMESTER** **HUMAN ANATOMY-I (Lab)**	**L-0** **T-0** **P-4** **C-2**
Course Outcomes:	**On completion of the course, the students will be:**	
CO1.	Describing all anatomical structures from a regional perspective.	
CO2.	Identifying muscles, bones, bony prominences joints, along with surface landmarks.	
CO3.	Demonstrating movements of joints.	
Course Content:		**Total Hours : 60**
	Surface Anatomy.	
	Histology General Histology, study of the basic tissues of the body; Microscope, Cell, Epithelium, Connective Tissue, Cartilage, Bone, Muscular tissue, Nerve Tissue – TS & LS, Circulatory system – large sized artery, medium sized artery, large sized vein, lymphoid tissue, Skin and its appendages.	
	Muscles of upper and lower extremities, trunk and face on a dissected human body.	
	Bones of human body with special emphasis on origin and insertion of muscles and ligaments.	
	Bones of human body with special emphasis on origin and insertion of muscles and ligaments. Surface anatomy of major nerves, arteries of the limbs. Points of palpation of nerves and arteries. Demonstration of dissected parts (upper extremity, lower extremity, thoracic & abdominal viscera, face and brain	
Text Books:	*1 Romanes [G J], Cunningham Manual of Lab Anatomy: Upper and Lower Limb Ed 15Vol 1 Oxford Medical Publication, Oxford 1996, P263.* *2. Romanes [G J], Cunningham Manual of Lab Anatomy: Thorax and Abdomen Ed 15 Vol II Oxford Medical Publication, Oxford 1996, P298.* *3. Romanes [G J], Cunningham Manual of Lab Anatomy: Head and Neck and Brain Ed 15 Vol II Oxford Medical Publication, Oxford 1996, P346.*	
Reference Books:	*1. Snell [Richard S], Clinical Anatomy for Medical Students: Little Brown and Company Boston.1995.* *2 Moorie [Kieth L], Clinically Oriented Anatomy. Ed.3. Williams And Wilkins, Baltimore,1992.* *3 Datta [A.K], Essentials of Human Anatomy: ThoraxAnd* *** Latest editions of all the suggested books are recommended.**	

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CourseCode :14702	SKILL ENHANCEMENT COURSE-2 B.P.T 1st SEMESTER HUMAN PHYSIOLOGY-I (Lab)	L-0 T-0 P-4 C-2	
Course Outcomes :	**On completion of the course, the students will be:**		
CO1.	Understanding the basic equipment used for physiological evaluations		
CO2.	Analyzing the physiological evaluation procedures		
CO3.	Applying the orientations and understandings of physiological evaluation procedures and the used instruments to carry out blood examinations and examination of blood pressure		
Course Content:		Total Hours: 45	
	Compound microscope		
	Study of common objects		
	Peripheral blood smear		
	Differential leucocyte count		
	Estimation of hemoglobin		
	Examination of arterial pulse		
	Recording of systemic arterial pressure		
	Estimation of blood group		
	Bleeding time and Clotting time		
Text Books:	*1. Sembulingum, K., Essentials of Medical Physiology, 4th edition, Jaypee Medical Pub*		
Reference Books:	*1 Ganong, Review of Medical Physiology, Pub. McGraw Hill, 23rd Edition.* *2 Samson Wright's Applied Physiology, Thirteenth Edition (Oxford Medicine Publication.* *3 Guyton & Halls, Medical Physiology, 12th edition, Saunders Elsevier.* *4 Chatterjee, Human Physiology, Central Book Agency.* *** Latest editions of all the suggested books are recommended.**		

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Course Code: 14703	**SKILL ENHANCEMENT COURSE-3** **B.P.T 1st SEMESTER** **BIOCHEMISTRY-I (Lab)**	L-0 T-0 P-2 C-1	
Course Outcomes:	**On completion of the course, the students will be:**		
CO1.	Demonstrating the concept of health and disease and applying biochemical tests to check for carbohydrates and proteins in samples.		
CO2.	Applying the concepts, theories and principles of human biochemistry tests.		
CO3.	Analyzing the knowledge of biochemical processes to investigate urine, glucose, urea, bilirubin and cholesterol-based samples.		
Course Content:		**TotalHours : 30**	
1.	Introduction and preparation of different types of solutions- Normal, Molar, Molar, %, g/l and mole fraction.		
2.	Preparation of 0.1 M Phosphate buffer of pH 7.2.		
3.	Determination of absorption maxima (λmax) of a Bromo-phenol blue.		
4.	Qualitative tests on carbohydrates to identify the nature of given sample.		
5.	Quantitative estimation of Total carbohydrate in given sample by Anthroone method.		
6.	Quantitative estimation of reducing sugar by 3',5'-Dinitrosalicylic acid (DNSA) method.		
7.	Quantitative estimation of proteins (viz. Folin-Phenol-Lowry method, Bradford method / UV method)		
8.	Quantitative estimation of nucleic acids by Diphenylamine (DPA) method		
9.	Determination of acid value of a given fat sample		
10.	Separation of amino acids by paper chromatography		
Text Books:	1 *Murray [Robert Kk], Harper's Bio Chemistry Ed 24, Prentice Hall. 1996, p925,* 2 *Ramakrishna [S], Prasanna [Kg], Rajan [R], Text Book of Medical Biochemistry, Edl, orient Langman, Bombay 1980, Vasudevan [Dm] And SreeKumari [S], Text Book of Bio Chemistry for Medical* 3 *Students, Ed 1, Jaypee Brothers, New Delhi, 1995, p637.* 4 *Das [Debajyothi], Biochemistry, Ed. 7, Academic Publishers Calcutta, 1992, P648,* 5 *Prasad Rm, Rm's Physiotherapy Textbook Series, Textbook of* 6 *Biochemistry for Bachelor of Physiotherapy First Edition, RM Publications, Mangalore.*		

Reference Books:	1 *lehninger [albert] ex. Al., principles of biochemistry, ed. 3, lbs publishers, delhi, 1993, p1143* 2 *Orten [James m] and neuhaus [oho w]. Human biochemistry, ed. 9, mosby, st. louis, 197 3p904* 3 *Strayer [lubert], biochemistry, ed. 4, wh, freeman & co., ny,1995, p1064.* 4 *Devlin [thomas m], biochemistry with clinical correalation, ed. 4, willey libs, ny1997, P1186.* * **Latest editions of all the suggested books are recommended.**		

(Dr. P. Kanungo)

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BAREILLY INTERNATIONAL UNIVERSITY, BAREILLY
FACULTY OF PARAMEDICAL SCIENCES

B.Sc. OPTOMETRY

[APPLICABLE W.E.F. ACADEMIC SESSION-2023-24 TILL REVISED]

[As per CHOICE BASED CREDIT SYSTEM (CBCS) guidelines given by UGC]

Rohilkhand Medical College Campus, Pilibhit by Pass Road, Bareilly. (U.P) – 243006 INDIA
Phone:- 0581-2526011, 2526012 (EPABX) Fax: 2526054, 2303345
E-mail: info@rmcbareilly.com, www.rmcbareilly.com

Study & Evaluation Scheme	
SUMMARY	
Institute Name	Faculty of Paramedical Sciences, Bareilly International University, Bareilly
Programme	B.Sc. Optometry
Duration	Four Year Full time (8 semesters)
Medium	English
Minimum Required Attendance	75%
Credits	
Maximum Credits	183

PROGRAMME OUTCOMES: (POs)

On completion of the programme, the students will be-

PO1.	Developing the ability to diagnose and manage various vision abnormalities including refractiveerrors as well as various eye diseases. **(Attitude)**
PO2.	Developing the ability to practice various sub-specialties of Eye care industry like Contact lens,spectacle dispensing, Orthoptics, Low Vision management, etc. **(Technology savvy/usage)**
PO2.	Developing the ability towards medical ethical as well as critical thinking **(Critical thinking)**
PO3.	Understanding environmental consciousness and societal & Community Eye care concerns inachieving the goal of vision for all. **(Social interaction &effective citizenship)**
PO4.	Developing the ability to communicate effectively both with the patients as well as within theorganization for effective team work **(Communication)**
PO5.	Recognizing and understanding the need to engage in life-long learning to upgrade oneself with Eyecare innovations **(Lifelong learning)**
PO6.	Developing and applying computer skills in Eye care system and taking entrepreneurial decisions. **(Entrepreneurship)**
PO7.	Applying systematized problem-solving techniques to identify and correct procedural errors to verifythe accuracy of ophthalmic diagnosis obtained **(Problem analysis and solving)**
PO8.	Understanding environmental consciousness and societal concerns in achieving sustainable development **(Environment and Sustainability)**

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❖Assessment:

	Internal	External	Total
Theory	30	70	100
Practical	15	35	50

Program Structure: B.Sc. Optometry

A. Introduction:

The Ministry of Health and Family Welfare, accepted in its entirety the definition of an allied and healthcare professional based on the afore-mentioned report, though the same has evolved after multiple consultations and the recommended definition is now as follows-

'Allied and healthcare professionals (AHPs) include individuals involved with the delivery of health or healthcare related services, with qualification and competence in therapeutic, diagnostic, curative, preventive and/or rehabilitative interventions. They work in multidisciplinary health teams in varied healthcare settings including doctors (physicians and specialist), nurses and public health officials to promote, protect, treat and/or manage a person('s) physical, mental, social, emotional, environmental health and holistic well-being.'

Since the past few years, many professional groups have been interacting and seeking guidance on all those who would qualify under the purview of "allied and healthcare professionals". In the healthcare system, statutory bodies exist for clinicians, nurses, pharmacists and dental practitioners; but a regulatory structure for around 50 professions is absent in India. Currently, the Government is considering these professions (as listed Annex-1) under the ambit of the allied and healthcare system. However, this number is subject to changes and modifications over time, particularly considering how quickly new technologies and new clinical avenues are expanding globally, creating newer cadres of such professionals.

Scope and Need for Allied and Healthcare Professionals in the Indian Healthcare System

The quality of medical care has improved tremendously in the last few decades due to the advances in technology, thus creating fresh challenges in the field of healthcare. It is now widely recognized that health service delivery is a team effort involving both clinicians and non- clinicians, and is not the sole duty of physicians and nurses.1Professionals that can competently handle sophisticated machinery and advanced protocols are now in high demand. In fact, diagnosis is now so dependent on technology, that allied and healthcare professionals (AHPs) are vital to successful treatment delivery.

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Effective delivery of healthcare services depends largely on the nature of education, training and appropriate orientation towards community health of all categories of health personnel, and theircapacity to function as an integrated team. For instance, in the UK, more than 84,000 AHPs, with a range of skills and expertise, play key roles within the National Health Service, working autonomously, in multi-professional teams in various settings. All of them are first-contact practitioners and work across a wide range of locations and sectors within acute, primary and community care. Australia's health system is managed not just by their doctors and nurses, but also by the 90,000 university-trained, autonomous AHPs vital to the system.

As the Indian government aims for Universal Health Coverage, the lack of skilled human resource may prove to be the biggest impediment in its path to achieve targeted goals. The

Benefits of having AHPs in the healthcare system are still unexplored in India. Although an enormous amount of evidence suggests that the benefits of AHPs range from improving access to healthcare services to significant reduction in the cost of care, though the Indian healthcare system still revolves around the doctor-centric approach. The privatization of healthcare has alsoled to an ever-increasing out-of-pocket expenditure by the population. However, many examplesassert the need of skilled allied and healthcare professionals in the system, such as in the case of stroke survivors, it is the support of AHPs that significantly enhance their rehabilitation and long-term treatment ensures return to normal life. AHPs also play a significant role to care for patients who struggle mentally and emotionally in the current challenging environment and require mental health support; and help them return to well-being. Children with communication difficulties, the elderly, cancer patients, patients with long term conditions such as diabetes people with vision problems and amputees; the list of people and potential patients who benefit from AHPs is indefinite.

Thus, the breadth and scope of the allied and healthcare practice varies from one end to another, including areas of work listed below:

- Across the age span of human development from neonate to old age;
- With patients having complex and challenging problems resulting from systemic illnesses such as, in the case of diabetes, cardiac abnormalities/conditions and elderly care to name a few;
- Towards health promotion and disease prevention, as well as assessment, management and evaluation of interventions and protocols for treatment;
- In a broad range of settings from a patient's home to community, primary care centers, to tertiary care settings; and
- With an understanding of the healthcare issues associated with diverse socio-economies and cultural norms within the society

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Programme Specific Outcomes (PSOs)

The learning and abilities or skills that a student would have developed by the end of four-year Bachelor of Optometry Programme.

PSO1.	Understanding the basic concepts & theories related to applied science, human anatomy& physiology, biochemistry, ocular anatomy & physiology
PSO2.	Understanding the concepts & theories, techniques & Procedures used in optometry.
PSO3.	Understanding & applying quality assurance, safety measures and maintenance ofophthalmic instruments
PSO4.	Analyzing eye environmental factors & selecting the relevant optical mode of correction & Evaluating different optical correction technique
PSO6.	Evaluating & determining tools, technique, methods, tests used in optometry
PSO7.	Designing & planning of new techniques, procedure for patient and clinic management.

B. Pedagogy & Unique practices adopted: "Pedagogy is the method and practice of teaching, especially for teaching an academic subject or theoretical concept". In addition to conventional time-tested lecture method, the institute will **emphasize on experiential learning.**

1. Role Play & Simulation: Role-play and simulation are forms of experiential learning. Learners take on different roles, assuming a profile of a character or personality, and interact and participate in diverse and complex learning settings. Role-play and simulation function as learning tools for teams and groups or individuals as they "play" online or face-to-face. They alter the power ratios in teaching and learning relationships between students and educators, as students learn through their explorations and the viewpoints of the character or personality they are articulating in the environment. This student-centered space can enable learner-oriented assessment, where the design of the task is created for active student learning. Therefore, role-play& simulation exercises such as virtual share trading, marketing simulation etc. are being promoted for the practical-based experiential learning of our students.

2. Video Based Learning (VBL) & Learning through Movies (LTM): These days technology has taken a front seat and classrooms are well equipped with equipment and gadgets. Video-based learning has become an indispensable part of learning. Similarly, students can learn various concepts through movies. In fact, many teachers give examples from movies during their discourses. Making students learn few important theoretical concepts through VBL & LTM is a good idea and method. The learning becomes really interesting and easy as videos add life to concepts and make the learning

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engaging and effective. Therefore, our institute is promoting VBL & LTM, wherever possible.

3. *Special Guest Lectures (SGL) &Extra Moral Lectures (EML):* Some topics/concepts need extra attention and efforts as they either may be high in difficulty level or requires experts from specific industry/domain to make things/concepts clear for a better understanding from the perspective of the industry. Hence, to cater to the present needs of industry we organize such lectures, as part of lecture-series and invite prominent personalities from academia and industry from time to time to deliver their vital inputs and insights.

4. *Special assistance programme for slow learners:* Special classes are arranged for slow learners. They are assisted patiently and consistently. Motivation is one of the most essential requirements to help them continue learning. Proper acknowledgement and praise help the overall development of such student.

Orientation programme: Two-week programme is arranged to introduce students to college services which will support their educational and personal goals. To facilitate initial academic advisement, course selection and registration, creating an atmosphere that minimizes anxiety, promotes positive attitude and stimulates excitement for learning. It also helps knowledge of scope, information regarding academic and student service resources and programme. It provides a welcoming atmosphere for students to meet faculty,

5. Staff and continuing students, as well as other new students.

6. *Mentoring scheme:* Every student is provided with a faculty mentor to help him/her in their personal & academic issues. The mentor maintains a register along with the mentor mentee booklet provided to all students. In that book all the details of student are filled and every month 2 times they meet with their mentor. Mentor filled the details of meeting in every student's register and tries to solve the issue and after solving the issue it updated in the register.

7. *Industry Focused programme:* Establishing collaborations with various industry partners to deliver the programme on sharing basis. The specific courses/contents are to be delivered by industry experts to provide practice-based insight to the students.

8. *Career &Personal Counseling* We have training and placement cell for career and personal counseling of the students. The training & placement cell make necessary arrangement for the interview of the students for internship as well as final placement of the students.

9. *Extra-curricular Activities*: organizing& participation in extracurricular activities will be mandatory to help students develop confidence & face audience boldly. It brings out their leadership qualities along with planning & organizing skills. Students undertake various cultural, sports and other competitive

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activities within and outside then campus. This helps them build their wholesome personality.

10. Participation in Workshops, Seminars & writing & Presenting Papers We are encouraging our students to participate in these types of activities. Most of our students are participating in these types of activities.

11. Formation of Student Clubs, Membership &Organizing& Participating events We have student club and our students are taking part in many events like youth festival and other activities those are performed in our Universities as well as in other Universities.

12. Capability Enhancement &Development Schemes: We are running some schemes like soft skill development, remedial coaching, yoga and meditation and personal counseling to enhance the capability and holistic development of the students.

13. Library Visit & Utilization of E-Learning Resources: The students are encouraged to visit the college library and university central library and utilize the resources like books, journals, e-journals, etc. to enhance and upgrade their knowledge. For this we have provision of Library schedule in our time table so student can use that time to ready different books and use E learn in library. We have well developed and organized library in our college as well as central library in the university campus.

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INTERNSHIP

Internship is a phase of training where a student is expected to conduct actual practice of clinical optometry and acquire skills under supervision so that he/she may become capable of functioning independently.

INTERNSHIP DURATION: ONE YEAR

- The internship time period provides the students the opportunity to continue to develop confidence and increased skill in diagnosis and management. Students will demonstrate competence in beginning, intermediate, and advanced procedures in above areas. Students will participate in advanced and specialized treatment procedures.
- The student will complete the clinical training by practicing all the skills learned in classroom and clinical instruction.
- The students are expected to work for minimum 6 hours per day and this may be more depending on the need and the healthcare setting.
- Internships postings can be in the following locations: Eye Hospitals, Eye clinics in general hospital, Independent eye clinics, Optometric clinics in eye hospitals, general hospitals or optical showrooms, optical showrooms and other relevant locations wherein the learning objective can be achieved. Short period of training to eye care (instruments, optical, contact lens) related manufacturing set-ups, corporates and nongovernmental organizations.

  Students have to undertake the rotational postings during which students have to work under supervision of an experienced staff in the following areas:

Sl.No	Departments	Duration
1.	Primary Eye Care	03Month
2.	Dispensing Optics	03Month
3.	Contact Lens	01Month
4.	Low Vision Aids	01Month
5.	Orthoptics	01Month
6.	Diagnostics	01Month
7.	Anterior Segment clinic	01Month
8.	Posterior Segment Clinic	01Month

Internship Log Book

Duly signed and completed Internship log book is compulsory to submit in the department/college to obtain internship completion and course completion certificate.

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B.Sc. Optometry: Four Years CBCS Programme							
Basic Structure: Distribution of Courses							
S.No.	Type of Course	Total courses	No. of Courses	Credits	Credits Hours	Total Credits Hours	Total Credits
1	Discipline Specific Course (DSC)	25	10	4	40	85	85
			15	3	45		
	MOOC*						
2	Skill-Enhancement Course (SEC)	23	17	01	34	98	49
			05	06	60		
			01	02	04		
3	Core Course (CC)	09	08	03	24	28	28
			01	04	04		
4	Ability-Enhancement Compulsory Course (AECC)	03	03	03	09	09	09
5	Discipline Specific Elective course (DSEC)	01	01	03	03	03	03
6	Open Elective Course (OEC)	02	02	03	06	06	06
	IKS	01	01	03	03	03	03
TOTAL CREDITS							183

(Sanjeev Bhatnagar) T. Teacher (G. Ratnagar) (Nidhi Singh) (Amitha Saxena) (Dr P. Ramoji)

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Study & Evaluation Scheme
B.Sc. Optometry - I Semester

S.NO.	CATEGORY	COURSE CODE	COURSE NAME	PERIODS			CREDITS	EVALUATION SCHEME		
				L	T	P		INTERNAL	EXTERNAL	TOTAL
1	CC-1		General Anatomy	3	-	-	3	30	70	100
2	CC-2		General Physiology	4	-	-	4	30	70	100
3	CC-3		General Biochemistry	3	-	-	3	30	70	100
4	DSC-1		Geometrical Optics I	4	-	-	4	30	70	100
5	CC-4		Nutrition	3	-	-	3	30	70	100
6	AECC-1		English and Communication	3	-	-	3	20	30	50
7	AECC-2		Basic of computers	3	-	-	3	20	30	50
8	SEC-1		General Anatomy-Practical	-	-	2	1	35	15	50
9	SEC-2		General Physiology-Practical	-	-	2	1	35	15	50
10	SEC-3		General Biochemistry-Practical	-	-	2	1	35	15	50
11.	SEC-4		Geometrical Optics-I Practical	-	-	2	1	35	15	50
Total				23		08	27	330	470	800

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Study & Evaluation Scheme
B.Sc. Optometry - II Semester

S.NO.	CATEGORY	COURSE CODE	COURSE NAME	PERIODS			CREDITS	EVALUATION SCHEME		
				L	T	P		INTERNAL	EXTERNAL	TOTAL
1	DSC-2		Ocular Anatomy	3	-	-	3	30	70	100
2	DSC -3		Ocular Physiology	4	-	-	4	30	70	100
3	DSC -4		Ocular Biochemistry	3	-	-	3	30	70	100
4	DSC -5		Physical Optics	4	-	-	4	30	70	100
5	DSC -6		Geometrical Optics II	4	-	-	4	30	70	100
6	AECC-3		Environmental Science	3	-	-	3	20	30	50
7	SEC -5		Ocular Anatomy – Practical	-	-	2	1	35	15	50
8	SEC -6		Ocular Physiology - Practical	-	-	2	1	35	15	50
9	SEC -7		Ocular Biochemistry - Practical	-	-	2	1	35	15	50
10	SEC -8		Geometrical Optics II Practical	-	-	2	1	35	15	50
11	SEC-9		Clinical Optometry-I	-	-	12	6			
Total				21		20	31	310	440	750

(Sakshi Bhatnagar) (T. Sneha) (Nidhi) (Manisha Saxena) (Dr. P. Kanniga)

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Study & Evaluation Scheme
B.Sc. Optometry - III Semester

S.NO.	CATEGORY	COURSE CODE	COURSE NAME	PERIODS			CREDITS	EVALUATION SCHEME		
				L	T	P		INTERNAL	EXTERNAL	TOTAL
1	DSC-7		Ocular Microbiology	3	-	-	3	30	70	100
2	DSC -8		Visual Optics- I	3	-	-	3	30	70	100
3	DSC -9		Optometric Optics – I	4	-	-	4	30	70	100
4	DSC-10		Optometric Instruments	4	-	-	4	30	70	100
5	DSC-11		Ocular Diseases – I	4	-	-	4	30	70	100
6	DSC-12		Clinical Examination of Visual System	3	-	-	3	30	70	100
7	IKS		Indian Medicine and Telemedicine	3	-	-	3	20	30	50
8	SEC-10		Optometric Optics –I Practical	-	-	2	1	35	15	50
9	SEC -11		Optometric Instruments Practical	-	-	2	1	35	15	50
10	SEC -12		Ocular Disease-I Practical	-	-	2	1	35	15	50
11	SEC-13		Clinical Optometry-II	-	-	12	6			
Total				24	-	18	33	305	495	800

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Study & Evaluation Scheme
B.Sc. Optometry - IV Semester

S.NO.	CATEGORY	COURSE CODE	COURSE NAME	PERIODS			CREDITS	EVALUATION SCHEME		
				L	T	P		INTERNAL	EXTERNAL	TOTAL
1	DSC-13		Optometric Optics –II & Dispensing Optics	4	-	-	4	30	70	100
2	DSC-14		Visual Optics II	3	-	-	3	30	70	100
3	DSC-15		Ocular Disease – II and glaucoma	4	-	-	4	30	70	100
4	CC-5		Pathology	3	-	-	3	30	70	100
5	DSC-16		Basic and Ocular Pharmacology	3	-	-	3	30	70	100
6	DSEC-1		Introduction to Quality And Patient Safety	3	-	-	3	20	30	50
7	CC-6		Medical Psychology	3	-	-	3	20	30	50
8	SEC-14		Optometric Optics –II & Dispensing Practical	-	-	2	1	15	35	50
9	SEC-15		Clinical Optometry-III	-	-	12	6			
10			MOOC-I	-	-	-	2*	-	-	100*
11			Open Elective				3	As per University Guidelines		
	Total			23		14	33+2*	205	445	650+ 100*

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Study & Evaluation Scheme
B.Sc. Optometry - V Semester

S.NO.	CATEGORY	COURSE CODE	COURSE NAME	PERIODS			CREDITS	EVALUATION SCHEME		
				L	T	P		INTERNAL	EXTERNAL	TOTAL
1	DSC-17		Contact Lens – I	3	-	-	3	30	70	100
2	DSC-18		Low Vision Care	3	-	-	3	30	70	100
3	DSC-19		Geriatric Optometry & Pediatric Optometry	4	-	-	4	30	70	100
4	DSC -20		Binocular Vision – I	3	-	-	3	30	70	100
5	DSC -21		Systemic Disease & the Eye	3	-	-	3	30	70	100
6	CC-7		Research Methodology & Biostatistics	3	-	-	3	20	30	50
7	SEC-16		Contact Lens – I Practical	-	-	2	1	15	35	50
8	SEC -17		Low Vision Care Practical	-	-	2	1	15	35	50
9	SEC -18		Geriatric Optometry & Pediatric Optometry Practical	-	-	2	1	15	35	50
10	SEC-19		Clinical optometry-IV	-	-	12	6			
			MOOC-II*	-	-	-	2*	-	-	100*
			Open Elective				3	As per University Guide line		
Total				19		18	31+2*	215	485	700+100*

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Study & Evaluation Scheme

B.Sc. Optometry - VI Semester

S.NO.	CATEGORY	COURSE CODE	COURSE NAME	PERIODS			CREDITS	EVALUATION SCHEME		
				L	T	P		INTERNAL	EXTERNAL	TOTAL
1	DSC-22		Contact Lens – II	3	-	-	3	30	70	100
2	DSC-23		Binocular Vision – II	3	-	-	3	30	70	100
3	DSC-24		Public Health and Community Optometry	3	-	-	3	30	70	100
4	CC-8		Practice Management	3	-	-	3	30	70	100
5	DSC -25		Occupational Optometry	3	-	-	3	30	70	100
6	CC-9		Medical Law and Ethics	3	-	-	3	20	30	50
7	SEC-20		Contact Lens – II Practical	-	-	2	1	15	35	50
8	SEC-21		Binocular Vision – II Practical	-	-	2	1	15	35	50
9	SEC-22		Clinical optometry-V	-	-	12	6			
10	SEC-23		Research Project I	-	-	4	2	50	50	100
Total				18		20	28	250	500	750

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New

Course Code: 14240	Core Course -1 B.Sc. Optometry Semester-I GENERAL ANATOMY	L-3 T-0 P-2 C-3
Course Outcomes:	**On completion of the course, the students will be:**	
CO1.	Understanding the concept & terminology of Human Anatomy	
CO2.	Enlisting and memorizing the structure, function & location of cells, tissues and major human organs system/part	
CO3.	Recognizing the different organ and organ system	
CO4.	Understanding relationship between different organ of the body with organ system	
CO5.	Developing a holistic approach to human health and medical research.	
Course Content		**45 Hours**
Unit-1:	Introduction to Human Anatomy: Anatomy: Definition and its relevance in medicine and optometry Planes of the body, relationship of structures, organ system Skeleton System	**09 Hours**
Unit-2:	Tissues of the Body: Epithelium, connective tissue, bone and cartilage, Embryology, histology, different types of each of them, types of cells, cellular differentiation and arrangements in different tissues Muscles:	**09 Hours**
Unit-3:	Blood vessels: Differentiation between arteries and veins, embryology, histology of both arteries and veins, Functional differences between the two, anatomical differences at different locations Skin and appendages: Embryology, anatomical differences in different areas, functional and protective variations, innervations, relationship with muscles and nerves	**09 Hours**
Unit-4:	Cardiovascular system: Heart-Size, location, Chambers, valves, Layers, blood supply of Heart, Conductive system of Heart Lymphatic system: Embryology, functions, relationship with blood vessels and organs Glands: Embryology, different types of glands (exocrine and endocrine), functional differences, neural control of glands	**09 Hours**

(Dr. P. Kanungo)

(Tabassum Fatima)

(Mamta Saxena)

(Dr. Nitish Mohan)

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Course: B.Sc. (Opt.)
First Semester

Total Hrs. 30

GENERAL ANATOMY

Unit-I Introduction to Human Anatomy, Anatomy: Definition and its relevance in medicine and optometry Planes of the body, relationship of structures, organ system, Skeleton System,

Unit-II Tissues of the Body: Epithelium, connective tissue, bone and cartilage, Embryology, histology, different types of each of them, types of cells, cellular differentiation and arrangements in different tissues.

Unit-III Blood vessels: Differentiation between arteries and veins, embryology, histology of both arteries and veins, Functional differences between the two, anatomical differences at different locations, Skin and appendages: Embryology, anatomical differences in different areas, functional and protective variations, innervations, relationship with muscles and nerves.

Unit-IV Glands: Embryology, different types of glands (exocrine and endocrine), functional differences, neural control of glands, Lymphatic system: Embryology, functions, relationship with blood vessels and organs.

Unit-V Nervous system: Parts of Nervous system, cell types of nervous system, Blood-brain barrier, Reflex arc, Peripheral Nerves, Spinal nerves, Nerve fibers, Autonomic Nervous system, Brain and Cranial nerves: Major parts of Brain, Protective coverings of the Brain, Cerebrospinal Fluid, Brain stem, Cerebellum, Diencephalon, Cerebrum, Cranial nerves.

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Unit-5:	**Nervous system:** Parts of Nervous system, cell types of nervous system, Blood-brain barrier, Reflex arc, Peripheral Nerves, Spinal nerves, Nerve fibers, Autonomic Nervous system **Brain and Cranial nerves:** Major parts of Brain, Protective coverings of the Brain, Cerebrospinal Fluid, Brain stem, Cerebellum, Diencephalon, Cerebrum, Cranial nerves	**09 Hours**
Text Books	1. B.D. Chaurasia: Handbook of General Anatomy, 2nd Ed., CBS Publishers and Distributors, New Delhi - 110 032.	
Reference Books	1. Peter L. Williams and Roger Warwick: - Gray's Anatomy-Descriptive and Applied, 36th Ed., 1980, Churchill Livingstone. 2. T.S. Ranganathan: Text book of Human Anatomy, 1982, S. Chand & Co., New Delhi 110055. 3. Inderbir Singh: Human Embryology, 3rd Ed., Macmillan India, 1981. 4. R. Kanagasuntharam, P. Sivananda-Singham & A. Krishnamurti 5. Anatomy-Regional, Functional, & Clinical, P.G. Publisher, Singapore 1987.	
E- Learning site	https://youtu.be/X5RUFXZZBH4 https://youtu.be/06o_XNKwuOE https://youtu.be/4Sab-2E4ZDI	

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Course Code: 14087	Core Course -2 B.Sc. Optometry Semester-I GENERAL PHYSIOLOGY	L-4 T-0 P-2 C-4
Course Outcomes	**On completion of the course, the students will be:**	
CO1.	Understanding concepts & terminology of human physiology	
CO2.	Enlisting and memorizing the function & structure of cells, tissues and major human organs systems/parts	
CO3.	Understanding function of various organ systems and employing its knowledge to identify diseases related tothem.	
CO4.	Identifying and explaining the interrelation between different organ systems.	
CO5.	Differentiating various organs & organs system	
Course Content		**45 Hours**
Unit-1:	**CELL STRUCTURE & ORGANIZATION** Tissue organization Epithelium Connective tissue –Collagen fibers –Elastic fibers –Areolar fibers Cartilage –Bone Contractile tissue –striated –skeletal –cardiac –non striated –plain –myoepithelial General principles of cell physiology Physiology of skeletal muscle **BLOOD:** Composition Volume measurement & variations Plasma proteins –classification & functions Red blood cells –development, morphology & measurements –functions & dysfunctions. White blood cells –development –classification, morphology –functions & dysfunctions Platelets –morphology –development, functions & dysfunctions Clotting –factors –mechanism –anti- coagulants dysfunctions Blood grouping –classification –importance in transfusion, Rh factor & incompatibility Suspension stability Osmotic stability Reticulo endothelial system a) Spleen b) lymphatic tissue c) Thymus d) bone marrow e) immune system f) cellular g) Humoral h) Autoimmune	**09 Hours**
Unit-2:	**DIGESTION:** General arrangement Salivary digestion –functions & regulations Gastric digestion –functions & regulations Pancreatic digestion –functions & regulations Intestinal digestion –functions & regulations Liver & bile Absorption Motility Deglutition Vomiting Defecation Functions of large intestine Neurohumoral regulations of alimentary functions, summary **EXCRETION:** Body fluids –distribution, measurement & exchange, Kidney –structure of nephron –mechanism of urine formation –composition of the urine and abnormal constituents –urinary bladder & micturition	**09 Hours**

Unit-3:	**ENDOCRINES:** Hormone mechanism –negative feed backs –tropic action –permissive action – cellular action, hypothalamic regulation Thyroid - hormones, actions, regulations Adrenal cortex - hormones, actions, regulations Adrenal medulla – hormones, actions, regulations Parathyroid - hormones, actions, regulations Islets of pancreas –hormones, actions, regulations Miscellaneous _ hormones, actions, regulations Common clinical disorders **REPRODUCTION:** Male reproductive system –control & regulation Female reproductive system – uterus –ovaries –menstrual cycle –regulation – pregnancy & delivery –breast – family planning	**09 Hours**
Unit-4:	**RESPIRATION:** Mechanics of respiration –pulmonary function tests –transport of respiratory gasesneural and chemical regulation of respiration –hypoxia, cyanosis, dyspnoea– asphyxia. **CIRCULATION:** General principles Heart: myocardium –innervation –transmission of cardiac impulse- Events during cardiac cycle –cardiac output. Peripheral circulation: peripheral resistances –arterial blood pressure –measurements –factors regulation variations –capillary circulation – venous circulation. Special circulation: coronary cerebral –miscellaneous	**09 Hours**
Unit-5:	**. ENVIRONMENTAL PHYSIOLOGY** Body temperature regulation (including skin Physiology). Exposure to low and high atmospheric pressure **NERVOUS SYSTEM:** Neuron –Conduction of impulse –synapse –receptor. Sensory organization – pathways and perception Reflexes –cerebral cortex –functions. Thalamus – Basal ganglia Cerebellum. Hypothalamus. Autonomic nervous system –motor control of movements, posture and equilibrium conditioned reflex, eye hand co-ordination **SPECIAL SENSES** (Elementary) Olfaction –Taste –Hearing	**09 Hours**
Text Books	1. Sujit K. Chaudhuri, Concise Medical Physiology, 6th edition, New Central Book Agency, Kolkata, 2008	
Reference Books:	1. AK Khurana, Indu Khurana: Anatomy and Physiology of Eye, Second edition, CBS Publishers, New Delhi,2006 2. A C Guyton: Text book of Medical Physiology, 8th edition, saunders company,Japan, 3. G J Tortora, B Derrickson: Principles of anatomy & physiology,11th edition, Harper & Row Publishers, New York 4. John Wiley & Sons Inc, New Jersey, 2007	
E- Learning site	https://youtu.be/JuhDx9hQAx8 https://youtu.be/Ta_vWUsrjho https://youtu.be/h1qSFZ9aw94	

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Course Code: 14088	**Core Course -3** **B.Sc. Optometry** **Semester-I** **GENERAL BIOCHEMISTRY**	**L-3** **T-0** **P-2** **C-3**
Course Outcomes	**On completion of the course, the students will be:**	
CO1.	Understanding the concepts and theories of Biochemistry related to optometry	
CO2.	Understanding the chemistry of carbohydrates, proteins, lipids and amino acids.	
CO3.	Analyzing the mechanism of enzyme action and identify the classes and factors affecting action	
CO4.	Understanding the biochemical testing and analyzing the test result.	
Course Content		**45 Hours**
Unit-1:	**Carbohydrate** Glucose; fructose; galactose; lactose; sucrose; starch and glycogen (properties and tests, Structure and function).	**9 hours**
Unit-2:	**Proteins**: Amino acids, peptides, and proteins (general properties & tests with a few examples like glycine, trytophan, glutathione, albumin, hemoglobin, collagen)	**9 hours**
Unit-3:	Lipids: Fatty acids, saturated and unsaturated, cholesterol and triacyglycerol, phospholipids and plasma membrane	**9 hours**
Unit-4:	Vitamins: General with emphasis on A,B2, C, E and inositol (requirements, assimilation and properties).	**9 hours**
Unit-5:	Minerals: Na, K, Ca, P, Fe, Cu and Se. (requirements, availability and properties)	**9 hours**
Text Books:	S. Ramakrishnan: Essentials of biochemistry and ocular biochemistry, Annamalai University Publications, Chidambaram,India, 1992	
Reference Books:	S. Ramakrishnan, K G Prasannan and R Rajan: Text book of Medical Biochemistry, Orient Longman, Madras, 1990. .D.R. Whikehart: Biochemistry of the Eye, 2ndedition, Butterworth Heinemann, Pennsylvania, 2003.	
E- Learning site	https://youtu.be/t5DvF5OVr1Y https://youtu.be/gggC9vctvBQ https://youtu.be/ufvZ8bYtyO8 https://youtu.be/Q6R4o-oECxs	

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New

Course Code: 14089	Discipline Specific Course -1 B.Sc. Optometry Semester-I GEOMETRICAL OPTICS-I	L-4 T-0 P-2 C-4
Course Outcomes	**On completion of the course, the students will be :**	
CO1.	Understanding concepts and theories of light, its nature & properties	
CO2.	Understanding concepts and properties of mirror & lenses.	
CO3.	Identifying various of lens& mirror during practical	
CO4.	Applying formula calculation related to vergence	
Course Content		**45 Hours**
Unit-1:	**Nature of light-** light as electromagnetic oscillation; speed of light in vacuum and other media, Wave front spherical, elliptical and plane. **Reflection and refraction of light-** laws of reflection and refraction. Total internal reflection. **Refractive index** -Its relation with wavelength, Fermat's and Huygen's Principle, Derivation of laws of reflection and refraction (Snell's law) from these principles	**09 hours**
Unit-2:	Plane mirror and spherical mirror- convex and concave mirror Reflection by a spherical mirror,paraxial approximation; signconvention Imaging by concave mirror and convex mirror Reflectivity, transmissivity; Snell's Law, Refraction at a plane surfaceGlass slab	**09 hours**
Unit-3:	**Definition** of crown and flint glasses; materials of high refractive index **Prism-** Angle of prism; deviation produced by a prism; refractive indexof the prism, definition of Prism diopter and application of prism. **Dispersion -** Angular dispersion; dispersive power	**09 hours**
Unit-4:	**Vergence of light** – convergence and divergence Vergence at a distance formula; effectivity of a refracting surface Image formation by a lens by application of vergence at a distance formula, definitions of front and back vertex powers; equivalent power;first and second principal planes/points; primary and secondary focal planes/points; primary and Secondary focal lengths **Newton's formula** linear magnification; angular magnification	**09 hours**
Unit-5:	**Imaging by a thin convex lens and thin concave lens**; Image properties (real/virtual; erect/inverted magnified/minified) for various object positions	**09 hours**

(Saurabh Bhatnagar) (Tabassum Fatima) (Nidhi Singh) (Manisha Saxena) (Dr. P. Kamboj)

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	System of two thin lenses: review of front and back vertex powers and equivalent Power, review of six cardinal points. System of more than two thin lenses; calculation of equivalent power using magnification formula	
Text Books:	1. Tunnacliffe A. H, Hirst J. G, Optics, The association of BritishDispensing Opticians, London, U.K., 1990.	
Reference Books:	1. Loshin D. S. The Geometric Optics Workbook, Butterworth-Heinemann, Boston, USA, 1991. 2. Schwartz S. H. Geometrical and Visual Optics: A ClinicalIntroduction, McGraw-Hill, New York, USA, 2002.	
E- Learning site	https://youtu.be/Xf_VZ8GxU1Y https://youtu.be/AIdgVKZWHgg **https://voutu.be/pzQdsg2Tugo**	

old

Course: B.Sc. (Opt.)
First Semester

Total Hrs. 45

GEOMETRICAL OPTICS-I

Unit-I Nature of light, light as electromagnetic oscillation; ideas of sinusoidal oscillations; amplitude and phase; speed of light in vacuum and other media; refractive index,
Wavefronts, spherical, elliptical and plane; Curvature and vergence; rays; convergence, and divergence in terms of rays and vergence; vergence at a distance,
Refractive index; its dependence on wavelength,
Fermat's and Huygen's Principle, Derivation of laws of reflection and refraction, (Snell's law) from these principles,
Plane mirrors, height of the mirror; rotation of the mirror.

Unit-II Reflection by a spherical mirror –paraxial approximation; sign convention; derivation of vergence equation,
Imaging by concave mirror, convex mirror,
Reflectivity; transmissivity; Snell's Law, Refraction at a plane surface,
Glass slab; displacement without deviation; displacement without dispersion,
Thick prisms; angle of prism; deviation produced by a prism; refractive index of the prism,
Prisms; angular dispersion; dispersive power; Abbe's number.

Unit-III Definition of crown and flint glasses; materials of high refractive index,
Thin prism definition; definition of Prism diopter; deviation produced by a thin, prism; it dependence on refractive index,
Refraction by a spherical surface; sign convention; introduction to spherical, aberration using image formed by a spherical surface of a distance object; sag formula,
Vergence at a distance formula; effectivity of a refracting surface.

Unit-IV Definition of a lens as a combination of two surfaces; different types of lens shapes,
Image formation by a lens by application of vergence at a distance formula; definitions of front and back vertex powers; equivalent power;
Newton's formula; linear magnification; angular magnification,
Nodal Planes,

Unit-V Imaging by a thin convex lens; image properties (real/virtual; erect/inverted; magnified/minified) for various object positions,
Imaging by a thin concave lens; image properties (real/virtual; erect/inverted; magnified/minified) for various object positions,
Prentice's Rule,
System of two thin lenses; review of front and back vertex powers and equivalent, power, review of six cardinal pointsm,
System of more than two thin lenses; calculation of equivalent power using, magnification formula.

Rakesh (S. Bhatnagar) T. Sahu (Chandramjatna) Nidhi Manish (Manisha Saxena) (Dr. P. Ramnaji's)

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Course Code: 14090	Core Course -4 B.Sc. Optometry Semester-I NUTRITION	L-3 T-0 P-0 C-3
Course Outcomes	**On completion of the course, the students will be:**	
CO1.	Understanding the concept of nutrition & its importance to eye	
CO2.	Understanding nutritional components& their requirements	
CO3.	Understanding the concept of mal nutrition & its impact on human health	
CO4.	Classifying & Analy zing appropriate nutrients requirement for human bodydisorder	
Course Content:		
Unit-1:	**Introduction:** History of Nutrition as a science food groups, RDABalanced diet, diet planning, assessment of nutritional, Status. **Energy:** Units of energy and value of food, Measurements Energy expenditure, Total energy/calorie requirement for different age groupsand diseases. Limitations of the daily food guide, Safety value, Energy imbalance- obesity, starvation, Limitations of the daily food guide.	9 hours
Unit-2:	**Proteins:** Sources and functions, Essential and non- essential amino-acids Incomplete and complete proteins, Supplementary foods. PEM and the eye, Nitrogen balance, Changes in protein requirement **Fat:** Sources and function, Essential fat, Excess and deficiency, Lipidsand the eye. Hyperlipidemia, heart diseases, atherosclerosis.	9 hours
Unit-3:	**Minerals:** General functions and sources, Macro and micro minerals associated with the eye. **Deficiencies and excess:** Ophthalmic complications (e.g. iron, calcium, iodine etc.)	9 hours
Unit-4:	**Vitamin:** General functions, and food sources, Vitamin deficiencies and associated eye disorders with particular emphasis to Vitamin A, Promoting sound habits in pregnancy, lactation and infancy. Nutrient with antioxidant. **Properties:** Digestion of Proteins, carbohydrates & lipids	9 hours
Unit-5:	Essential amino acids. Miscellaneous Measles and associated eye disorders, low birth weight	9 hours
Text Books:	1.Frank Eperjesi& Stephen Beatty: Nutrition and the Eye a Practical Approach, Elsevier Butterworth- Heinemann, USA, 2006	
E- Learning site	1. https://alison.com/courses/nutrition 2. https://www.coursera.org/browse/health/nutrition	

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Course Code: 14092	Ability Enhancement Course-1 B.Sc. Optometry Semester-I ENGLISH AND COMMUNICATION	L-3 T-0 C-3
Course Outcomes	**On completion of the course, the students will be :**	
CO1.	Understanding the basics of English communication	
CO2.	Understanding the basic concepts of functional grammar	
CO3.	Preparing basic official written communication	
CO4.	Demonstrating effective speaking skills	
CO5.	Demonstrating comprehension in reading text	
Course Content:		
Unit-1:	**ENGLISH** **Basics of Grammar**-Vocabulary, Synonyms, Antonyms, Prefix and Suffix, Homonyms, Analogies and Portmanteau words. **Basics of Grammar** – Part II- Active, Passive, Direct and Indirect speech, Prepositions, Conjunctions and Euphemisms **Writing Skills**- Letter Writing, Email, Essay, Articles, Memos, one word substitutes, note making and Comprehension	09
Unit-2:	**Writing and Reading**- Summary writing, Creative writing, newspaper reading **Practical Exercise**- Formal speech, Phonetics, semantics and pronunciation **COMMUNICATION** **Introduction**-Communication process, Elements of communication, Barriers of communication and how to overcome them, Nuances for communicating with patients and their attenders in hospitals.	09
Unit-3:	**Speaking**-Importance of speaking efficiently, Voice culture, Preparation of speech. Secrets of good delivery, Audience psychology, handling, Presentation skills, Individual feedback for each student, Conference/Interview technique **Listening**- Importance of listening, Self-assessment, Action plan execution, Barriers in listening, Good and persuasive listening.	09
Unit - 4	**Reading**- What is efficient and fast reading, Awareness of existing reading habits, Tested techniques for improving speed, Improving concentration and comprehension through systematic study.	09
Unit - 5	**Non Verbal Communication** Basics of non-verbal communication, Rapport building skills using neuro- linguistic programming (NLP), Communication in Optometry practice	09
Reference Books:	1. *English Grammar Composition and Usage* by J.C. Nesfield, Macmillian Publishers. 2. *Communication Skills* by Sanjay Kumar & PushpLata, Oxford University Press 3. *Business Writing for Dummies (3rd Edition)* by Natalie Canavor,For Dummies 4. *Reading and Listening Comprehension Skills* by Michelle Osment, Curriculum Concepts 5. *Unveiling the Secrets of Verbal Ability* by Abhishek Verma and Shweta Bajaj, Research India	

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Course Code: 14091	Ability Enhancement Course-1 B.Sc Optometry Semester-I Basics of Computer	L-3 T-0 C-3
Course Outcomes	**On completion of the course, the students will be :**	
CO1.	Understanding the fundamentals and history of computer	
CO2.	Understanding the concept of Computer's Memory Management andprocessing	
CO3.	Understanding and applying the basic functions on documentsheet, Spread sheet and presentation slide	
CO4.	Understanding the concept of Internet, Web and Websites	
CO5.	Understanding and applying the Web surfing, E mail and recognize e mail netiquette	
Course Content:		
Unit-1:	**Introduction to computer**: Introduction, characteristics of computer, block diagram of computer, generations of computer, computer languages, Input output devices: Input devices(keyboard, point and draw devices, data scanning devices, digitizer, electronic card reader, voice recognition devices, vision-input devices), output devices(monitors, pointers, plotters, screen image projector, voice response systems). **Processor and memory**: The Central Processing Unit (CPU), main memory, Storage Devices: Sequential and direct access devices, magnetic tape, magnetic disk, optical disk, mass storage devices	**6 hours**
Unit-2:	**Introduction of windows**: History, features, desktop, taskbar, icons on the desktop, operation with folder, creating shortcuts, operation with windows (opening, closing, moving, resizing, minimizing and maximizing, etc.) **Introduction to MS-Word**: introduction, components of a word window, creating, opening and inserting files, editing a document file, page setting and formatting the text, saving the document, spell checking, printing the document file, creating and editing of table, mail merge.	**6 hour**
Unit-3:	**Introduction to Excel:** introduction, about worksheet, entering information, saving workbooks and formatting, printing the worksheet, creating graphs, Introduction to power-point: introduction, creating and manipulating presentation, views, formatting and enhancing text, slide with graphs.	**6 hou**

(S. Bhadraya) (Tabassumfatima) (Nidhi Singh) (Manisha Saxena)

Unit-4:	**Introduction of Operating System**: introduction, operating system concepts, types of operating system, Computer networks: introduction, types of network (LAN, MAN, WAN, Internet, Intranet), network topologies (star, ring, bus, mesh, tree, hybrid), components of network.	**6 hours**
Unit-5:	**Internet and its Applications**: definition, brief history, basic services (E-Mail, File Transfer Protocol, telnet, the World Wide Web (WWW), www browsers, use of the internet. Application of Computers in clinical settings.	**6 hours**
Text Books:	1. Sinha P.K., Computer Fundamentals, BPB Publishing.	
ReferenceBooks:	1. Peter Norton's, Introductions to Computers, Tata McGraw Hill. 2. Price Michael, Office in Easy Steps, TMH Publication. ***Latest editions of all the suggested books are recommended.**	

(Tabassumjatima) (Vaidhvi singh) (Manisha Sisodiya)

FACULTY OF PARAMEDICAL SCIENCES ASHANTI BAREILLY

Note: Course outcome of following practical's are covered in their respective theory courses

Course Code:	Skill Enhancement Course - 1 Bachelor of Optometry Semester-I General Anatomy- Practical	L-0 T-0 P-2 C-1
Course Outcomes		
1.	Demonstration of Major organs through models and permanent slides.	
2.	Demonstration of parts of circulatory system from models.	
3.	Demonstration of parts of respiratory system from models.	
4.	Demonstration of digestive system from models.	
5.	Demonstration of excretory system from models.	
6.	Demonstration of nervous system from models.	
7.	Structure of eye and ear	
8.	Demonstration of structural differences between skeletal, smooth and cardiac muscles.	
9.	Demonstration of various bones	
10.	Demonstration of various joints	
11.	Demonstration of various parts of male & female reproductive system from model	

(S. Bhatnagar) (Tabassum Fatima) (Nidhi Singh) (Manisha Saxena) (Dr. P. Kanojia)

FACULTY OF PARAMEDICAL SCIENCES SHIATS PRAYAGRAJ BAREILLY

Note: Course outcome of following practical's are covered in their respective theory courses

Course Code:	Skill Enhancement Course-2 Bachelor of Optometry Semester-I General Physiology- Practical	L-0 T-0 P-2 C-1
Course Outcomes		
1.	To measure pulse rate	
2.	To measure blood pressure	
3.	Demonstration of ECG	
4.	To perform Hemoglobin by CMG method	
5.	To perform Total RBC count.	
6.	To perform total leucocyte count	
7.	To perform differential leucocyte count.	
8.	To perform PCV	
9.	To calculate Red cell indices	

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Note: Course outcome of following practical's are covered in their respective theory courses

Course Code:	Skill Enhancement Course -3 Bachelor of Optometry Semester-I General Biochemistry - Practical	L-0 T-0 P-2 C-1
Course Outcomes		
1.	Reactions of monosaccharides, disaccharides and starch: Glucose: Fructose Galactose: Maltose, lactose Sucrose: Starch	
2.	Analysis of unknown Sugars Estimations: Photometry: Bio fluid of choice – blood, plasma, serum Standard graphs: Glucose Proteins: Urea Creatinine: Bilirubin	

(Dr. P. Kanmani)

FACULTY OF PARAMEDICAL SCIENCES
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Note: Course outcome of following practical's are covered in their respective theory courses

Course Code:	**Skill Enhancement Course -4** **Bachelor of Optometry** **Semester-I** **Geometrical Optics - Practical**	**L-0** **T-0** **P-2** **C-1**
Course Outcomes		
1.	Thick Prism – determination of prism angle and dispersive power; calculation of the refractive index	
2.	Thin Prism – measurement of deviation; calculation of the prism diopter	
3.	Image formation by spherical mirrors	
4.	Convex lens - power determination using lens gauge, power determination using distant object method; power determination using the Vergence formula	
5.	Concave lens – in combination with a convex lens – power determination	

(Manisha Saxena)

Principal
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BAREILLY INTERNATIONAL UNIVERSITY, BAREILLY

FACULTY OF PARAMEDICAL SCIENCES

Bachelor of Science in Radiological Imaging Techniques (B.SC. RIT)

[APPLICABLE W.E.F. ACADEMIC SESSION-2023-24 TILL REVISED]

[As per CHOICE BASED CREDIT SYSTEM (CBCS) guidelines given by UGC]

Rohilkhand Medical College Campus, Pilibhit by Pass Road, Bareilly. (U.P) – 243006 INDIA
Phone:- 0581-2526011, 2526012 (EPABX) Fax: 2526054, 2303345
E-mail: info@rmcbareilly.com, www.rmcbareilly.com

BAREILLY INTERNATIONAL UNIVERSITY

Institute Name	Bareilly international University Faculty of Paramedical Sciences
Programme	Bachelor of Science in Radiological Imaging Techniques
Duration	Three year (06 Semester) Full time and Six Months Internship.
Medium	English
Minimum Attendance Required	75%
Minimum Credits	*175*

❖ PROGRAMME OUTCOMES: (POs)

On completion of the programme, the students will be

PO1.	Understanding ways of functioning effectively as an individual/ independently and as a member in diverse team in multidisciplinary settings.**(Attitude)**
PO2.	Understandingrequirementsofcontinuouseducationasafunctionofgrowthandmaintenanceof Professional competence.**(Lifelong learning)**
PO3	Understanding environmental consciousness and societal concerns in achieving sustainable development.**(Environment and Sustainability)**
PO4.	Applying computer skills in healthcare system and taking entrepreneurial decisions.**(Entrepreneurship)**
PO5.	Applying knowledge to assess societal, health, safety and legal issues related to professional practice.**(Social interaction &effective citizenship)**
PO6.	Applying systematized problem solving techniques to identify and correct procedural errors to verify the accuracy of laboratory result obtained.**(Problem analysis and solving)**
PO7.	Applying appropriate techniques, resources and tools with an understanding of limitations. **(Technology savvy/usage)**
PO8.	Developing the ability towards ethical as well as critical thinking.**(Critical thinking)**
PO9.	Executing professional conduct and interpersonal communicational skills effectively with society at large.**(Communication)**

PROGRAMME SPECIFIC OUTCOMES: (PSOs)

The learning and abilities or skills that a student would have developed at the end:

PSO1.	Understanding the basic concepts, theories of applied sciences (physics, chemistry, Anatomy, physiology, biochemistry, pathology) relevant to radiological imaging techniques.
PSO2.	Remembering the relationship between physics and Radio diagnosis & modern imaging
PSO3.	Understanding provisions for radiation safety by various national & international regulatory bodies and applying quality assurance measures, safety procedures and maintenance of radiological equipment.
PSO4.	Understanding of health care organization in India & basic medical terminology.
PSO5.	Operating all radiological and imaging equipment independently and perform the image processing in X-Ray, Fluoroscopy, Computed Tomography, Dual Energy X-Ray Absorptiometry (DEXA),Mammography, Digital Subtraction Angiography, Magnetic Resonance Imaging, Ultrasonography, Nuclear Medicine
PSO6.	Analyzing the protocols in Radiological Procedures & evaluating the factors affecting technical qualityof images and various pathological conditions.
PSO7.	Creating & Formulating plan for handling patient with drugs & equipment in general As well in emergency situation.

❖ Assessment:

	Internal	External	Total
Theory	30	70	100
Practical	15	35	50

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Programme Structure

INTRODUCTION

High-quality Paramedical education is essential for the digital age and using technology is powerful way to enhance changing requirements of the dynamic and improved medical field profession. Bachelor of Science in Radiological Imaging Techniques (Radio diagnosis/CT/MRI/X-Ray/Mammography) is a 3.5 years undergraduate programme meticulously structured to impart in-depth advance knowledge of Imaging methodologies and principles. The curriculum has been designed to meet the growing needs of professionals in the field of clinical radiography, radiation safety, image processing technology, imaging modalities, etc. The programme prepares students to work collaboratively, evaluate data, interpret results, think vitally, draw logical conclusions and make composite decisions. The curriculum of the programme gives students the opportunities to devise plausible solutions to real-life situations in an active health care environment. The programme broadly emphasizes the following key areas Human Anatomy, Human Physiology, Radiation Physics, Pathology, Radio Diagnosis, , Medical Biochemistry, Specialized Diagnostic Techniques, Radio graphhic Technology. Bachelor of Science in Radiological Imaging Techniques students should be equipped to work across time zones, languages, and cultures. Employability, innovation, theory to practice connectedness to the professionalstaff is the central focus of Bachelor of Science in Radiological Imaging Techniques curriculum. The curriculum is designed as such that the students can gain an in-depth mastery of the academic discipline and applied functional areas necessary to meet the requirements of academic and hospital administration.

Faculty of Paramedical Sciences emphasis on the following courses ***balanced with core, discipline specific and elective courses:*** The curriculum of Bachelor of Science in Radiological Imaging Techniques program emphasizes an intensive, flexible education with 175 credits are assigned for the B.Sc. RIT degree.

The programme structure and credits for Bachelor of Science in Radiological Imaging Techniques are finalized based on the stake holder's requirements and general structure of the programme. Out of 175 credits of classroom contact teaching, 36 credits are to be allotted for core courses (CC), 09 credits are allotted to ability enhancement compulsory courses (AECC), 56 credits are allotted to skill enhancement courses (SEC), 3 credits are allotted to open elective courses (OEC), 68 credits are allotted to Discipline specific (DSC), and 3 credits for Indian Knowledge System (IKS).

Internship Duration & Guidelines

Internship for qualifying B.SC.RIT programme will be of six months. Minimum 720 hours of internship should be completed by the candidate to be awarded the degree.

Students have to undertake the rotational postings during which students have to work under supervision of an experienced staff in the following areas:

Sl.No	Postings	Duration
1.	Conventional radiography	01Month
2.	Radiographic special procedures including diagnostic and Therapeutic Interventional Procedures	01Month
3.	CR, DR and PACS	01Month
4.	Computed Tomography	01Month
5.	Magnetic Resonance Imaging	01Month
6.	Mammography (Female Only), Ultrasound and PET	01Month

1. Entire internship shall be done in a Hospital or Medical College.
2. Every candidate after successfully completing the final examination Bachelor of Sciencein Radiological Imaging Techniques will be required to undergo compulsory rotatory internship up to satisfaction oftheUniversityforaperiodofsixmonthssoastobeeligiblefortheawardof the degree of
3. BachelorofScienceinRadiologicalImagingTechniquesandregistration.
4. The University shall issue a provisional degree of Bachelor of Science in Radiological Imaging Techniques on passing the final examination after the completion of internship onDemand by the candidate.
5. The internee shall have been trusted with clinical responsibilities under direct supervision ofSenior Medical Officer/ Technologist. They shall not be working independently.
6. Internee will not issue any certified copy of investigation reports or other related documentsunder their signature

- **Assessment**

1.	The Internee shall maintain the record of work, which is to be verified and certified byt Technologist followed by HOD Radiology under whom he /she works. Apart fromscrutiny record of work, assessment and evaluation of training shall be undertaken by an objecti approach using situation tests in knowledge, skills and attitude during at the end of traini Based on the record of work and date of evaluation. The Director/ Principal shall iss certificate for satisfactory completion of training following which the university shall aw the degree of Bachelor of Science in Radiological Imaging Techniques.
2.	Satisfactory completion shall be determined on the basis of the following. Proficiency of knowledge required for each Imaging techniques or procedures.
	The competency and skills expected to manage each radiographic technique.
	Responsibility, punctuality, works up of radiographic techniques, involvement in spe procedures and preparation of reports.
	Capacity to work in a team (behavior with colleagues, nursing staff and relationship with medical and paramedical staffs).
	Initiating, participating in discussions and developing research aptitude.

Internship Log Book

Duly signed and completed Internship log book is compulsory to submit in the department/college obtain internship completion and course completion certificate.

B.Sc.RIT: Three Year (6 Semester) CBCS Programme							
Basic Structure: Distribution of Courses							
S. No	Type of Course	Total Courses	No. of Courses	Credits	Credit Hours	Total Credits Hours	Total Credits
1	Core Course (CC)	11	08	03	24	36	36
			03	04	12		
2	Ability-Enhancement Compulsory Course (AECC)	03	03	03	09	09	09
3	Discipline Specific Course (DSC)	22	20	03	60	68	68
			02	04	08		
4	Skill Enhancement Course (SEC)	26	21	01	42	112	56
			01	05	10		
			02	06	24		
			02	09	36		
5	Open Elective Course (OEC)	01	01	03	03	03	03
7	Indian Knowledge System (IKS)	01	01	03	03	03	03
TOTAL		64		-	-	231	175

(S. Bhadrajan) (Tabassum Jahan) (Nidhi Singh) (Gayatha Saxena) (Dr. P. Kannojiya)

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CHOICE BASED CREDIT SYSTEM (CBCS)

Choice Based Credit System (CBCS) is a versatile and flexible option for each student to achieve his target number of credits as specified by the UGC and adopted by our University.

The following is the course module designed for the B. Sc. RIT program:

✓ ***Core Course (CC):*** Core courses of B.Sc.RIT program will provide a holistic approach to clinical or practical education, giving students an overview of the field, a basis to build and specialize upon. These core courses are the strong foundation to establish radiographic knowledge and provide broad multi-disciplined knowledge can be studied further in depth during the elective phase.

The core courses will provide more practical-based knowledge, case-based lessons and collaborative learning models. It will train the students to analyze, decide, and lead-rather than merely know-while creating a common student experience that can foster deep understanding, develop decision-making ability and contribute to the hospital and community at large.

A wide range of core courses provides groundwork in the basic hospital management disciplines, patient care handling, responsible radiographer, organizational behavior and human resources etc. The integrated foundation is important for students because it will not only allow them to build upon existing skills, but they can also explore career options in a range of industries, and expand their understanding of various fields.

The college offers eight core courses from first to fourth semester during the B.Sc.RIT program. There will be different credits for each core course offered as already described in above table.

✓ ***Ability Enhancement Compulsory Course (AECC):*** As per the guidelines of Choice Based Credit System (CBCS) for all Universities, including the private Universities, the Ability Enhancement Compulsory Course (AECC) is a course designed to develop the ability of students in communication (especially English) and other related courses where they might find it difficult to communicate at a higher level in their prospective job at a later stage due to lack of practice and exposure in the language, etc. Students are motivated to learn the theories, fundamentals and tools of communication which can help them develop and sustain in the corporate environment and culture. The college offers five AECCs from first to fourth semester. Each AECC will be of different credits.

✓ ***Skill Enhancement Course (SEC):*** This course is designed to provide value-based and/ or skill-based knowledge. The college offers twenty-three SECs from I Semester to VI Semester. Each SEC will carry different credits.

✓ ***Open Elective Course (OEC):*** Open Elective is an interdisciplinary additional subject that is compulsory in the third semester of a program. The score of Open Elective is counted in student's overall aggregate marks under Choice Based Credit System (CBCS). Department offers two Open Elective course of 3 Credits and students will have the choice of taking 1 open elective in Semester IV and V.

✓ ***Discipline Specific Elective Course (DSEC):*** Discipline Specific Elective Course (DSEC) is offered in semester V and VI for students with three credits. It provides two subjects in which student will choose anyone to improve their knowledge in specific course for further studies.

(Lakshi Bhatnagar) (Tabassum Jadiya) (Nidhi Singh) (Monika Saxena) (Dr. Priyanka Jain)

✓ ***Value Added Course (VAC):*** A value added course is a non-credit course which is basically meant to enhance general ability of students in areas like soft skills, quantitative aptitude and reasoning ability - required for the overall development of a student and at the same time crucial for industry/ corporate demands and requirements. The student possessing these skills will definitely develop acumen to perform well during the recruitment process of any premier organization and will have the desired confidence to face the interview. Moreover, these skills are also essential in day-to-day life of the corporate world. The aim is to nurture every student for making effective communication, developing aptitude and a general reasoning ability for a better performance, as desired in corporate world. There shall be one course each in Semester III &Semester IV and will carry no credit, however, it will be compulsory for every student to pass these courses with minimum 45% marks to be eligible for the degree certificate. These marks will not be included in the calculation of CGPI. Students have to specifically be registered in the specific course of the respective semesters.

✓ ***Indian knowledge system (IKS):*** India has a rich tradition of intellectual inquiry and textual heritage that goes back several thousands of years. India was advanced in knowledge systems, traditions, and practices since antiquity. The whole range of knowledge systems is multifarious, from the Vedas, and Upanishads to scriptural, philosophical, scientific, technological and artistic sources. The disciplines and domains of knowledge include logic, philosophy, language, technology and crafts, polity, economics and governance, ethics and sociological orders, architecture and engineering, pure sciences, earth sciences, bio sciences, poetics and aesthetics, law and justice, grammar, mathematics and astronomy, metrics, agriculture, mining, metallurgy, trade and commerce, Ayurveda and yoga, medicine and life sciences, geography, military science, weaponry, ship building, navigation and maritime traditions, biology and veterinary science etc.

○ ***Pedagogy & Unique practices adopted:*** "Pedagogy is the method and practice of teaching, especially for teaching an academic subject or theoretical concept". In addition to conventional time-tested lecture method, the institute will **emphasize on experiential learning:**

1. **Role Play & Simulation:** Role-play and simulation are forms of experiential learning. Learner stake on different roles, assuming a profile of a character or personality, and interact and participatein diverse and complex learning settings. Role-play and simulation function as learning tools for teams and groups or individuals as they "play" online or face-to-face. They alter the power ratios inteaching and learning relationships between students and educators, as students learn through their explorations and the view points of the character or personality they are articulating in the environment. This student- centered space can enable learner-oriented assessment, where the design of the task is created for active student learning. Therefore, role-play& simulation exercises such as virtual share trading, marketing simulation etc. are being promoted for the practical-based experiential learning of our students.
2. **Video Based Learning (VBL):** These days' technology has taken a front seat and class rooms are well equipped with equipment and gadgets. Video- based learning has become an indispensablepart of learning. Similarly, students can learn various concepts through educational or clinical videos. In fact, many teachers give examples from movies during their discourses. Making studentslearn few important theoretical concepts through VBL is a good idea and method. The learning becomes really interesting and easy as videos add life to concepts and make the learning engaging and effective. Therefore, our institute is promoting VBL, wherever possible.

(Pedagogy) (Value based courses) (Mathematics) (Quantitative courses)

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3. **Special Guest Lectures (SGL) & Extra Moral Lectures (EML):** Some topics/concepts need extra attention and efforts as they either may be high in difficulty level or requires experts from specific industry/ domain to make things/ concepts clear for a better understanding from the perspective of the industry. Hence, to cater to the present needs of industry we organize such lectures, as part of lecture-series and invite prominent personalities from academia and industry fromtime to time to deliver their vital inputs and insights.

4. **Special assistance program for slow learners:** Write the note how would you identify slow learners, develop the mechanism to correcting knowledge gap. Terms of advance topics what learning challenging it will be provided to the fast learners

5. **Orientation program:** Two week programme is arranged to introduce students to college services which will support their educational and personal goals. To facilitate initial academic advisement, course selection and registration, creating an atmosphere that minimizes anxiety, promotes positive attitude and stimulates excitement for learning. It also helps knowledge of scope, information regarding academic and student service resources and programme. It provides a welcoming atmosphere for students to meet faculty, staff and continuing students, as well as other new students.

6. **Mentoring scheme:** Today the lines between mentoring and networking are blurring. Students and mentor complete this word by mentoring with their bonding. A Mentor is assigned for a groupof 25-30 students to guide the students to acquire the clinical or academic knowledge.

7. **Extracurricular Activities:** Organizing & participation in extracurricular activities will be mandatory to help students develop confidence & face audience with care.

Study & Evaluation Scheme

B.Sc.RIT- Semester-I

S.NO.	CATEGORY	COURSE CODE	COURSE NAME	PERIODS			CREDIT	EVALUATION SCHEME		
				L	T	P		INTERNAL	EXTERNAL	TOTAL
1	CC-1	14187	Human Anatomy I	4		-	4	30	70	100
2	CC-2	14188	Human Physiology I	4		-	4	30	70	100
3	CC-3	14191	Bio-Chemistry I	4		-	4	30	70	100
4	DSC-1	14189	Basic Physics including Radiological Physics	4		-	4	30	70	100
5	AECC-1	14192	Basic computer and information science	3	-	-	3	20	30	50
6	DSC-2	14190	Radio graphic and Processing Techniques	4		-	4	30	70	100
8	SEC-1	14756	Human Anatomy I (Lab)	-	-	2	1	15	35	50
9	SEC-2	14757	Human Physiology I (Lab)	-	-	2	1	15	35	50
10	SEC-3	14758	Bio-Chemistry(Lab)	-	-	2	1	15	35	50
11	SEC-4	14798	Basic Physics including Radiological Physics(Lab)	-	-	2	1	15	35	50
12	SEC-5	14799	Radio graphic and Processing Techniques(Lab)	-	-	2	1	15	35	50
Total				23	-	10	28	295	505	800

FACULTY OF PARAMEDICAL SCIENCES BAREILLY

Study & Evaluation Scheme

B.Sc.RIT- Semester -II

S. No.	CATEGORY	COURSE CODE	COURSE	PERIOD			CREDIT	EVALUATIONSCHEME		
				L	T	P		INTERNAL	EXTERNAL	TOTAL
1	CC-4	14193	Human Anatomy II	3	-	-	3	30	70	100
2	CC-5	14194	Human Physiology II	3	-	-	3	30	70	100
3	CC-6		Bio-Chemistry II	3	-	-	3	30	70	100
4	DSC-3	14195	Basic Physics including Radio logical Physics-II	3	-	-	3	30	70	100
5	DSC-4	14196	Conventional Radiography and equipment	3	-	-	3	30	70	100
6	DSC-5	14197	Clinical Radiography-positioning-I	3	-	-	3	30	70	100
7	AECC-2	14198	English communication and soft skills	3	-	-	3	20	30	50
8	SEC-6	14760	Human Anatomy II(Lab)	-	-	2	1	15	35	50
9	SEC-7	14761	Human Physiology II (Lab)	-	-	2	1	15	35	50
10	SEC-8		Bio-Chemistry II (Lab)			2	1	15	35	50
11	SEC-9		Basic Physics including Radio logical Physics-II (Lab)	-	-	2	1	15	35	50
12	SEC-10		Clinical Radiography-positioning-I (Lab)	-	-	2	1	15	35	50
13	SEC-11		Radiographic Positioning and Basic Views (Lab)	-	-	2	1	15	35	50
14	SEC -12		Clinical Posting			12	6			
TOTAL				21	0	24	33	290	660	950

(S.B Nadnagar) (Tabassum Fatima) (Nidhi Singh) (Manisha Saxena) (Dr. P. Kanojia)

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Study & Evaluation Scheme
B.Sc.RIT- Semester-III

S.N	CATEGORY	COURSE CODE	COURSE	PERIODS			CREDIT	EVALUATIONSCHEME		
				L	T	P		INTERNAL	EXTERNAL	TOTAL
1	DSC-6	14199	Radiation safety in diagnostic radiology-I	3	-	-	3	30	70	100
2	CC-7	14200	Pathology	3	-	-	3	30	70	100
3	DSC-7	14201	Contrast &Special Radiography Procedures	3	-	-	3	30	70	100
4	DSC-8	14202	Clinical Radiography Positioning-II	3	-	-	3	30	70	100
5	DSC-9	14203	Modern Radiological &Imaging Equipment including Physics	3	-	-	3	30	70	100
6	CC-8	14204	Research methodology and Biostatics	3	-		3	30	70	100
7	SEC-13	14763	Radiation safety in diagnostic radiology-I(Lab)	-	-	2	1	15	35	50
8	SEC-14		Contrast &Special Radiography Procedures (Lab)			2	1	15	35	50
9	SEC-15		Clinical Radiography Positioning-II(Lab)			2	1	15	35	50
10	SEC-16		Modern Radiological &Imaging Equipment including Physics(Lab)			2	1	15	35	50
11	SEC-17		Clinical posting			10	5			
			Total	18	0	18	27	240	560	800

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FACULTY OF PARAMEDICAL SCIENCE
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Study & Evaluation Scheme

B.Sc.RIT- Semester-IV

S. N.	CATEGORY	COURSE CODE	COURSE	PERIODS			CREDIT	EVALUATIONSCHEME		
				L	T	P		INTERNAL	EXTERNAL	TOTAL
1	DSC-10	14205	Radiation safety in diagnostic Radiology- II	3	-	-	3	30	70	100
2	DSC-11	14206	Newer Imaging techniques including patient care-I	3	-	-	3	30	70	100
3	DSC-12	14207	Physics of newer Imaging modalities	3	-	-	3	30	70	100
4	DSC-13	14208	Quality control in radiology & radiation safety-I	3	-	-	3	30	70	100
5	CC-9		Introduction to quality &patient safety	3	-	-	3	30	70	100
6	AECC-3		Environmental Science	3	-	-	3	20	30	50
7	SEC-18		Radiation safety in diagnostic Radiology- II(Lab)	-	-	2	1	15	35	50
8	SEC-19	14764	Quality control in radiology & radiation safety-I (Lab)	-	-	2	1	15	35	50
9	SEC-20		Clinical Posting	-	-	12	6			
			TOTAL	18	0	16	26	200	450	650

(Dr. P. Jeannoji's)

FACULTY OF PARAMEDICAL SCIENCE ASHANT BAREILLY

Study & Evaluation Scheme

B.Sc.RIT- Semester -V

S.N.	CATEGORY	COURSE CODE	COURSE	PERIODS			CREDIT	EVALUATION SCHEME		
				L	T	P		INTERNAL	EXTERNAL	TOTAL
1	DSC-14	14211	Physics of advanced imaging technology-I	3	-	-	3	30	70	100
2	DSC-15	14212	Radiographic Techniques in advanced imaging technology-I	3	-	-	3	30	70	100
3	DSC-16	14213	Hospital Practice &care of patient-I	3	-	-	3	30	70	100
4	DSC-17	14214	Newer Imaging techniques including patient care-II	3	-	-	3	30	70	100
5	DSC-18	14215	Quality control in radiology & radiation safety-I	3	-		3	30	70	100
6	CC-10	14216	Medical Terminology & record keeping	3			3	30	70	100
7	SEC-21	14765	Physics of advanced imaging technology-I (Lab)			2	1	15	35	50
8	SEC-22	14766	Radiographic Techniques in advanced imaging technology-(Lab)			2	1	15	35	50
9	SEC-23		Clinical Posting	-	-	18	9			
10	OEC		Open Elective Course	-	-	-	3	As per University Guidelines		
Total				18	0	22	32	210	490	700

(Dr. P. Ramnoja)

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SHANTI SCHOOL OF PARAMEDICAL SCIENCE
BAREILLY

Study & Evaluation Scheme

B.Sc.RIT- Semester-VI

S.NO	CATEGORY	COURSE CODE	COURSE	PERIODS			CREDIT	EVALUATIONSCHEME		
				L	T	P		INTERNAL	EXTERNAL	TOTAL
1	DSC-19	14217	Physics of advanced imaging technology-II	3	-	-	3	30	70	100
3	DSC-20	14218	Regulatory requirements in diagnostic radiology	3	-	-	3	30	70	100
4	DSC-21	14219	Hospital practice &care of patient-II	3	-	-	3	30	70	100
5	DSC-22	14220	Radiographic Techniques in advanced imaging technology-II	3	-	-	3	30	70	100
6	IKS		Essence of indian knowledge tradition	3			3	30	70	100
7	CC-11	14221	Medical Law &ethics	3	-		3	30	70	100
8	SEC-24	14267	Physics of advanced imaging technology-II (Lab)			2	1	15	35	50
9	SEC-25	14768	Radiographic Techniques in advanced imaging technology-II(Lab)	-	-	2	1	15	35	50
10	SEC-26		Clinical Posting	-	-	18	9			
Total				18	0	22	29	210	490	700

(S. Bhatnagar) (Tabassum Fatima) (Siddhi & Gandhi) (Mamta Saxena) (Dr. P. Kannojia)

FACULTY OF PARAMEDICAL SCIENCE Principal BAREILLY

New

Course Code: 14187	**CORE COURSE (CC)– 1** **B.Sc.RIT-SEMESTER-I** **Human Anatomy I**	L-4 T-0 P-2 C-5
Course Outcomes:	**On completion of the course, the students will be:**	
CO1.	Understanding different terminology and recognizing organs, organ system and different sample collection site.	
CO2.	Identifying and discussing the major structures of human body.	
CO3.	Demonstrating various organ systems and employ knowledge of human anatomy to solve questions regarding functions & diseases.	
CO4.	Differentiating the various organ system and its related disorders.	
CO5.	Developing a holistic approachto human health and medical research.	
Course Content:		
Unit-1:	Terminology and General Plane of the Body, Body Parts and Areas, Terms of Location and Position, Body Cavities and Their Membranes, Dorsal cavity, Ventral cavity, Planes and Sections	**09 Hours**
Unit-2:	Cells: Structure, function and location, Prokaryotic and eukaryotic cells, Cell organelles, Cell division. Tissue, Types, Structure, Location and Function of Epithelial Tissue, Connective Tissue, Muscle Tissue, Nerve Tissue, Membranes, Glandular tissue. The Integumentary System: structure and function of The Skin, Subcutaneous Tissue.	**12 Hours**
Unit-3:	Musculoskeletal System: Basic anatomy of bones, Axial, Appendicular Skeleton, Classification of Bones, Joints, Classification of Joints, Name of the muscles of body. Cardiovascular syestem- Heart-size,location,chambers exterior&interior Blood supply of Heart,Systemic and Pulmonary circulation Brief introduction about Lymphatic System	**10 Hours**
Unit-4:	Respiratory system: Basic anatomy of nose, larynx, trachea, bronchi and lungs	**08 Hours**
Unit-5:	Digestive system: basic anatomy of esophagus, stomach, small intestine, large intestine, liver, gallbladder, pancreas.	**06Hours**
Text Books:	*1.SujitChaudhary, 2.Sembulingam*	
Reference Books:	1. *Anatomy & Physiology, Ross & Wilson* 2. *Human Anatomy, BD Chaurasia* 3. *Text book of Medical Physiology Guyton and Hall* 4. *Principles of Anatomy and Physiology, Gerard J. Tortora and BryanH.Derrickson* ***Latest editions of all the suggested books are recommended.***	

T. Fatma (Tabassum Fatima)

Nidhi Sharma (Nidhi Singh) (Manisha Saxena)

(Dr. Nitesh Mishra)

Principal ASHANTI PARAMEDICAL SCIENCE BAREILLY

old

Course: B.Sc. (RIT)-1st Sem.
HUMAN ANATOMY -I

Total: 36 hours

Unit- 1

Introduction Human body as a whole:

1. Definition of anatomy and its divisions, Terms of location, positions and planes.
2. **Cell** - cell structure comprising of nucleus, organelles, cytoplasm, cell membrane.
3. **Epithelium**-definition, classification, describe with examples, functions.
4. **Glands**- classification, describe serous & mucous glands with examples.
5. **Basic tissues** – classification with examples.

Unit- 2

Locomotion and Support:

1.**Cartilage**- types with example & histology.

2. **Bone** – Classification, names of bone cells, parts of long bone, microscopy of compact bone, names of bones, vertebral column, inter vertebral disc,

3. **Joints** – Classification of joints with examples, synovial joint (in detail for radiology).

4. **Muscular system**- Classification of muscular tissue & histology, Names of muscles of the body.

Unit- 3

Cardiovascular System:

Heart - size, location, chambers, exterior & interior, Blood supply of heart, Systemic & pulmonary circulation, Branches of aorta, common carotid artery, subclavian artery, axillary artery, brachial artery, superficial palmar arch, femoral artery, internal iliac artery, Peripheral pulse, Inferior venacava, portal vein, Great saphenous vein, Histology of lymphatic tissues, Names of regional lymphatics, axillary and inguinal lymph nodes in brief.

Unit- 4

Gastro-intestinal System:

Parts of GIT, Oral cavity (lip, tongue (with histology), tonsil, dentition, pharynx, salivary glands Waldeyer's ring), Oesophagus, stomach, small and large intestine, liver, gall bladder, pancreas, Spleen, Radiographs of abdomen.

Respiratory System: Parts of RS, nose, nasal cavity, larynx, trachea, lungs, bronchopulmonary segments, Peritoneum, Histology of trachea, lungs and pleura, Names of para-nasal air sinuses.

Unit- 5

Radiological anatomy

1. Radiographs of upper limb & lower limb: shoulder, elbow, wrist joint, hand, hip, knee, ankle joint & foot
2. X-ray of abdomen, X-ray of thorax, X-ray of skull, X-rays of neck.

Text Books:

1.Chourasia's Text Book of Anatomy
2. P.R. Ashalatha and G. Deepa's A Text Book of Anatomy & Physiology
3. Ranganathan, T.S., A Text Book of Human Anatomy

Reference Books:

1. B.D. Chaurasia's Handbook of General Anatomy
2.William Davis, Understanding Human Anatomy and Physiology, McGraw Hill
3. Fattana, Human Anatomy, (Description and Applied), Saunder's & C P Prism Publishers, Bangalore
4. Ester. M. Grishcimer, Physiology & Anatomy with Practical Considerations, J.P.Lippin Cott.

(Dr. P. Kannojia)

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New

Course Code: 14188	**CORE COURSE (CC)-2** **B.Sc.RIT-SEMESTER-I** **Human Physiology I**	L-4 T-0 P-2 C-5
Course Outcomes:	**On completion of the course, the students will be:**	
CO1.	Understanding the function & structure of cells, tissues and major human organs system/parts	
CO2.	Identifying and explaining the inter relation between different organ systems to maintain biological equilibrium	
CO3.	Demonstrating functions of various organ systems and employ its knowledge to understand diseases	
CO4.	Differentiating and drawing the diagram of various organs & organs system.	
CO5.	Evaluating and determining various experimental techniques related to physiology	
Course Content:		
Unit-1:	Cell physiology: Structure, membrane, transport across cell membrane, Active, Passive, Organization of the Body, Body Composition, Body Fluid Volumes and its measurement, Diffusion, Osmosis, Tonicity, Homeostasis	08 Hours
Unit-2:	Blood- composition, function, cellular component & their function, hemoglobin& anemia, blood groups and coagulation Lymphatic system-Composition& function of lymph, lymphatic tissue, Immunity with the role of thymus	10 Hours
Unit-3:	Cardiovascular system-general arrange, heart, arteries, veins and capillaries ,heart structure and function, cardiac cycle, heart sounds, heart rate, bloodpressure,mechanism of circulation,definition of hypertension&shock	10 Hours
Unit-4:	Respiratory system: parts of respiratory system, mechanism of respiration, pulmonary function, pulmonary circulation, lungs volume, Gas transportbetweenlungsandtissues,Definitionofhypoxia,dyspnoea,cyanosis,asphyxia and obstructive air ways diseases	07 Hours
Unit-5:	Gastrointestinal physiology: Organs of GIT and their structure & function, secretion, digestion, absorption and assimilation, gastro intestinal hormones, physiology of digestion of carbohydrates, proteins & lipids, Structure & Function of liver, spleen, gall bladder & pancreas, Jaundice, Cirrhosis &Pancreatitis.	10 Hours
Text Books:	1. *Sujit Chaudhary* 2. *Sembu lingam* 3. *Guyton and Hall*	
Reference Books:	1. *Anatomy &Physiology, Ross & Wilson* 2. *Human Anatomy, BD Chaurasia* 3. *Principles of Anatomy and Physiology, Gerard J. Tortora and Bryan H. Derrickso* ***Latest editions of all the suggested books are recommended.**	

(Dr. P. Jeannojia)

(Habeeba Fatima) (Vidhi Singh) (Manisha Saxena)

FACULTY OF PARAMEDICAL SCIENCES BAREILLY

ASHANTI

old

Course: B.Sc. (RIT)-1st Sem.
HUMAN PHYSIOLOGY -I

Total: 36 hours

Unit -1

Cell: Morphology, Structure and functions of cell organelles, Structure of cell membrane, Transport across cell membrane, Intercellular communication Homeostasis.

Blood: composition & function of blood, Haemopoiesis, Haemostasis, Blood cells, hemoglobin.

Plasma: composition, formation & functions, Plasma proteins; Types & functions, Blood groups, Coagulation factors, Blood transfusion, Anemia.

Resistance & Immunity: innate immunity, Acquired immunity, Humoral & cell immunity.

Unit -2

Muscular System: Muscles of the body – Types & their functions, Properties of Skelton muscle, Cardiac muscle & Smooth muscle.

Cardiovascular System: Heart & blood vessels: Systemic circulation pulmonary circulation, Heart rate, Cardiac cycle; definition & Phases of cardiac cycle, Cardiac output; definition, normal value. ECG, Blood pressure; definition & normal values, Factors affecting blood pressure, Shock- definition, classification, Causes & features Hypertension, Radial pulse.

Unit -3

Lymphatic System: Lymph glands and its function, Spleen Structure and functions, Lymphatic tissue & organs Tonsil, Thymus.

Unit -4

Respiratory System: Physiology of Respiratory System, Gas exchange in lungs, Transport of gases between lungs to tissue, Pulmonary circulation, Ventilation, Functions, Lung's volume and capacities, Hypoxia, Hypercapnoea, Hypocapnoea, Artificial respiration, Disorders of respiration: dyspnoea, orthopnoea, hyperpnoea, hyperventilation, apnoea, tachypnoea, Regulation of respiration.

Unit -5

Gastrointestinal System: Process of digestion in various parts, Functions of oral cavity, Pharynx, salivary glands, oesophagus, Stomach, Small intestine, large intestine, Liver, Gall bladder, Pancreas.

Text Books:

1. N. Geeta's Textbool of Physiology
2. P.R. Ashalatha and G. Deepa's A Text Book of Anatomy & Physiology

Reference Books:

1. K. Sembulingam & Prema Sembulingam's Essentials of medical Physiology
2. C.C. Chatterjee's Human Physiology
3. C.C. Chatterjee's Practical Physiology for paramedical Courses
4. R.K. Maurya's Medical Physiology.

(Dr. B.K. Kannojia)

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Course Code: 14191	**CORE COURSE (CC)-3** **B.Sc.RIT-SEMESTER-I** **Bio-Chemistry-I**	L-4 T-0 P-2 C-5
Course Outcomes:	**On completion of the course, the students will be:**	
CO1.	Understanding the concepts and theories of Biochemistry related to Radiodiagnosis	
CO2.	Summarizing the chemistry of carbohydrates, proteins, lipids and amino acids.	
CO3.	Understanding the mechanism of enzyme action and identify theclasses and factors affecting action.	
CO4.	Analyzing the biochemical testing and analyzing the test result.	
Course Content:		**45 hours**
Unit-1:	**Introduction to biochemistry**: Scope of biochemistry ; Cell and its biochemical organization. Introduction to Fundamental and Clinical Biochemistry, First aid in laboratory accidents.Principle,working,care& maintenance of Weighing balance, Hot plate, centrifuges, incubator, hot air oven, colorimeter, spectro photometer, pH meter.	**8Hours**
UNIT-2;	**.Carbohydrates** • Definition, classification with examples, chemicalproperties • Monosaccharides - Structure of glucose, fructose, andgalactose • Disaccharides - structure of maltose, lactose, andsucrose • Polysaccharides - chemical nature of starch andglycogen	**08Hours**
UNIT-3;	**.Lipids** • Definition, classification with examples • Structure and properties of triglycerides (oils and fats) • Fatty acid classification - Based on chemical and nutritional requirements with examples • Structure and functions of cholesterol in the body • Lipoproteins - types, composition and functions in thebody	**8Hours**
UNIT-4	**Proteins** • Definition, classification of proteins based on composition and solubility with examples • Definition, classification of amino acids based on chemical nature and nutritional requirements withexamples • Structure of proteins (four levels of organization of protein structure) • Diseases related to malnutrition of proteins.	**8Hours**
Unit-5;	**Nucleic acids** • Definition, purine and pyrimidine bases • Components of nucleosides and nucleotides withexamples • Structure of DNA (Watson and Crick model), RNA and their functions	**8Hours**
Text Books:	1. *Bishop, Clinical Chemistry* 2. *Teitz, Clinical Chemistry*	
Reference Books:	1. *Varley, Clinical Chemistry* 2. *Vasudevan DM & Sreekumari S, Text book of Biochemistry formedical students* 3. *U. Satyanarayn, Medical Biochemistry Chatterjee, Text book of Biochemistry*	

Dr. P. Kannojiya

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Course: B.Sc. (RIT)-1st Sem.
BIOCHEMISTRY

Total: 40hours.

Unit-1

Nutrition: Introduction, Composition of food, RDA, BMR, SDA, caloric requirement and Importance of nutrition Calorific values, Respiratory quotient, Physical activities (Energy expenditure), Role of carbohydrates, lipids and proteins in diet. Balanced diet and nutritional disorders.

Carbohydrates: Definition, classification, chemistry with examples, Structures, composition, sources, properties and functions of Monosaccharides, Disaccharides, Oligosaccharides and Polysaccharides. Glycosaminoglycan (mucopolysaccharides) metabolism (Glycogenesis, Glycogenolysis, Gluconeogenesis, Cori cycle), T.C.A cycle, glycolysis.

Lipids: Definition, classifications and general functions. Essential fatty acids and their importance, Metabolism- Oxidation of fatty acids, metabolism, oxidation of fatty acids, lipoproteins, Phospholipids, Cholesterol, lipolysis, lipogenesis, ketosis and ketone bodies metabolism.

Unit- 2

Amino Acids: Definition, classification, essential and non-essential amino acids, metabolism (fate of ammonia) and urea cycle. Biological important peptides, functions of proteins and amino acids. Enzymes: Definition, classification with examples, cofactors, Factors affecting enzyme action, isoenzyme and co-enzyme, Clinical importance of enzymes.

Biochemistry of connective tissue: Introduction, various connective tissue proteins: collagen, glycoproteins and proteoglycans, elastin- structure and associated disorders.

Vitamins: Definition, classification and functions, deficiency disorders, sources, RDA, digestion, absorption, transport and toxicity of individual vitamins.

Unit- 3

Clinical Biochemistry: Relevance of blood and urine levels of Glucose, Urea, Uric acid, Calcium, Phosphates, Liver function tests, Renal function tests. Creatinine, pH and Bicarbonate. Lipid Profile-Tri - Glyceride, Cholesterol/HDL/LDL/ALDL Etc.; Protein & Aggression, Glycosuria.

Nucleic acid: Function of DNA and RNA, chemistry, structure of DNA ((Watson and Crick model), Structure and functions of tRNA, rRNA, mRNA. Nucleotides and nucleosides.

Muscle Contraction: Contractile elements in muscle. Energy for muscle contraction.

Unit- 4

Biochemical hormones: Definition, Classification, Receptors, signal transduction, second messengers. Mechanism of Hormone action, effect of Insulin, Glucagon, Catecholamines, Thyroxine, Mineralocorticoids and Glucocorticoids. Diabetes mellitus: definition types & causes.

Biochemical organization of Human Cell: Introduction, cell structure, Cell membrane structure and functions, Types of Absorption of mechanism, organelles and their functions, Cytoskeleton Minerals metabolism- definition, sources, RDA, digestion, absorption, transport, excretion, functions and disorders- Calcium, Phosphate, Iron Magnesium, Fluoride, Selenium, Molybdenum, Copper. Phosphate, Calcium and Iron in detail.

Unit- 5

Acid base balance: Acid, base and buffers, Ph, Buffer System of The Body, Bicarbonate buffer system. Role of Lungs and kidneys in acid base balance, acid base imbalance. Water balance-Body water and its distribution, Regulation of water balance-Role of ADH and Thirst center. Electrolyte Balance- Osmolarity, Role of Aldosterone, Renin-Angiotensin System and ANF.

Text Book & Reference Book:

1. Bishop- Clinical Chemistry.
2. Teitz- Clinical Chemistry.
3. U. Satyanarayn, Medical Biochemistry Chatterjee, Text book of Biochemistry.
4. Varley, Clinical Chemistry
5. Vasudevan DM & Sreekumari S, Text book of Biochemistry for medical students.

(P. Kannojia) (Nidhi Singh) (Manisha Saxena) (T. Fatima)

Course Code: 14189	**DISCIPLINE SPECIFIC COURSE (DSC)-1** **B.Sc.RIT-SEMESTER-I** **Basic Physics including Radiological Physics**	L-4 T-0 P-2 C-5
Course Outcomes:	**On completion of the course, the students will be:**	
CO1.	Understanding the basic concepts, theories & method, in applied physicsrelevant to radiological imaging techniques & image quality	
CO2.	Categorizing provisions for radiation safety by various national & internationalregulatory bodies.	
CO3.	Tagging of different imaging modalities in Radio diagnosis department	
CO4.	Differentiating EMR radiation and its application in X –ray diagnosis and therapy.	
CO5.	Evaluating the factors affecting the image quality from x ray.	
Course Content:		
Unit-1:	**Basic concepts:** Units & Measurements, Basic concepts of power, work, force, energy – Einstein's formula, temperature and heat-SI units of above parameters, atomic structure, atomic model, Nucleus, Atomic Number, Mass Number, electron orbit and energy levels, Periodic table, Isotopes, Isobars, Ionization and excitation, Electron binding energy, nuclear binding energy, Electron Volt.	**08 Hours**
Unit-2:	**Electricity and Magnetism:** Electric charges, Coulomb's law, Unit of charge, Electric potential, unit of potential, Electric induction, capacitance and Capacitors, Electrical energy and power, Sources of electrical energy, Electric current, unit, Types, Alternating currents: Peak and RMS values and current and voltage resistance, Ohm's law, circuit laws, heating effect of current, Ammeter, Voltmeter, Galvanometer. Magnets and Magnetic field, EMF, Magnetic effect of an electric current, applications of magnetic field, Electro-magnetic induction, laws of mutual induction and self-induction, Electromagnet, & Solenoid.	**09 Hours**
Unit-3:	**Electromagnetic waves**: Introduction, Maxwell's equation, energy density and intensity, momentum, electromagnetic spectrum and radiation in Atmosphere. Electromagnetic radiation – Quantum Nature of radiation, Mass energy equivalence, Fluorescence, Electromagnetic Spectrum. **Sound** - The nature and propagation of sound wave (the characteristics of sound, wave theory), speed of sound in a material medium, intensity of sound, the decibel, Interference of sound waves, beats, diffraction. Doppler's effect.	**10 Hours**
Unit-4:	**Heat**-Definition of heat, temperature, Heat capacity, specific heat capacity, Heat transfer conduction, convection, radiation, thermal conductivity, equation for thermal conductivity (k), the value of k of various material of interest in radiology, thermal expansion, Newton's law of cooling, Heat radiation.	**08Hours**
Unit-5:	**Electronics – Semiconductors:** Conduction in crystals, Energy bands. Intrinsic and Extrinsic semiconductors n-type and p-type semiconductors, majority and minority carriers. Semiconductor diodes: p-n junction-properties forward and reverse bias, characteristics of p-n junction. **Rectifiers:** Half-wave and full wave, ripple factor, Efficiency of HW and FW rectifiers. Filter circuits; Zener diode, regulated power supply. **Transistors:** Symbols, Transistor connections and characteristics, Transistor as an amplifier, load line analysis, operating point, types of amplifiers-voltage and power amplifiers. Feedback - negative feedback in amplifiers.	**10 Hours**
Text Books:	1. Rehani, *Advance Medical Physics* 2. Faiz M Khan, *Radiation Physics*	
Reference Books:	1. *K Thayalan, Basics of Radiation Physics* 2. *Christensen's Physics Of Diagnostic Radio diagnosis*	

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Unit-4:	**Factors affecting Image Quality**: Meaning of radiographic image contrast, density, resolution, sharpness, magnification and distortion of image, noise and blur. Radiographic illuminators and viewing conditions, visual acuity and resolution. **Presentation of radiographs**-opaque letters and markers-Identification of dental films preparation of stereo radiographs-viewing conditions.	Hours
Unit-5:	**Radiographic image**-components of image quality, Unsharpness in radiographic image contrast of the radiographic image-distinctness of the radiographic image-size, shape and spatial relationships. **Factors affecting Image Quality**: Meaning of radiographic image contrast, density, resolution, sharpness, magnification and distortion of image, noise and blur. Radiographic illuminators and viewing conditions, visual acuity and resolution. **Presentation of radiographs**-opaque letters and markers-Identification of dental films preparation of stereo radiographs-viewing conditions.	08 Hours
Text Books:	1. *Cristensens, Text book in diagnostic Radio diagnosis*	
Reference Books:	1. *K Thaylan- Basic radiological physics-Text book in diagnostic Radio diagnosis- Latestedition* 2. *Satish K Bhargava, Hand book of radiation Physics-Latest edition*	

Course Code: 14192	**ABILITY ENHANCEMENT COMPULSORY COURSE-1** **BRIT 1st SEMSETER** **BASIC COMPUTER AND INFORMATION SCIENCE**	**L-3** **T-0** **P -0** **C-3**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	Understanding the fundamentals and history of computer	
CO2.	Understanding the concept of Computer's Memory Management andprocessing	
CO3.	Understanding and applying the basic functions on document sheet, Spread sheet and presentation slide	
CO4.	Understanding the concept of Internet, Web and Websites	
Course Content:		
Unit-1:	Introduction to computer: Introduction, characteristics of computer, block diagram of computer, generations of computer, computer languages. Input output devices: Input devices(keyboard, point and draw devices, data scanning devices, Digitizer , electronic card reader, voice recognition devices, vision-input devices), output devices(monitors, pointers, plotters, screen image projector, voice response systems).	
Unit-2:	Processor and memory: The Central Processing Unit (CPU), main memory. Storage Devices: Sequential and direct access devices, magnetic tape, magnetic disk, optical disk, mass storage devices. Introduction of windows: History, features, desktop, taskbar, icons on the desktop, operation with folder, creating shortcuts, operation with windows (opening, closing, moving, resizing, minimizing and maximizing, etc.)	
Unit-3:	Introduction to MS-Word: introduction, components of a word window, creating, opening and inserting files, editing a document file, page setting and formatting the text, saving the document, spell checking, printing the document file, creating and editing of table, mail merge. Introduction to Excel: introduction, about worksheet, entering information, saving workbooks and formatting, printing the worksheet, creating graphs	
Unit-4:	Introduction to power-point: introduction, creating and manipulating presentation, views, formatting and enhancing text, slide with graphs. Introduction of Operating System: introduction, operating system concepts, types of operating	

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Principal

	system.
Unit-5:	Computer networks: introduction, types of network (LAN, MAN, WAN, Internet, Intranet) network topologies (star, ring, bus, mesh, tree, hybrid), components of network Internet and its Applications: definition, brief history, basic services (E-Mail, File Transfer Protocol, telnet, the World Wide Web (WWW)), www browsers, use of the internet. Application of Computers in clinical settings.
Text Books:	**1. Sinha P.K., Computer Fundamentals, BPB Publishing.**
Reference Books:	• **Peter Norton's, Introductions to Computers, Tata McGraw Hill.** • **Price Michael, Office in Easy Steps, TMH Publication.** • ***Latest editions of all the suggested books are recommended.**

(Dr. S. Bhatnagar) (Tabassum Fatima) (Vidhi Singh) (Manisha Saxena) (Dr. P. Kannoje)

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Course Code: 14190	**DISCIPLINE SPECIFIC COURSE (DSC)-2** **B.Sc.RIT-SEMESTER-I** **Radiographic and Imaging Processing Techniques**	**L-4 T-0 P-2 C-5**
Course Outcomes:	**On completion of the course, the students will be:**	
CO1.	Understanding the basic concepts, theories & method, in applied physics relevant to radiological imaging techniques & image quality	
CO2.	Describing the correlation between Radio diagnosis and physics.	
CO3.	Analyzing different EMR radiation and its application in medicaldiagnosis and therapy.	
CO4.	Understanding ofdifferent imaging modalities in Radio diagnosis department.	
Course Content:		
Unit-1:	**Radiographic Film**: Structure of film emulsion, film characteristics (speed, base + fog, gamma, latitude), effect of grain size on film response to exposure, interpretation of characteristics curve, Grain Technology, Gelatin-Basic film types, Film formats and packing. Direct exposure duplitised films, Single coated emulsions, Films for specialized use-manufacturing process. Structure, properties of different parts, handling, film wrappings. Handling of exposed and unexposed films. Types, applications, advantages/limitations of different types, safe light requirements. **Sensitometer:** Photographic density-characteristic curve-information from the characteristic curve-speed Vs definition. Storage of X-ray film. **Control of scattered radiation**: Methods of minimizing formation of scatter radiation, effectiveness of grids-grid ratio-preventing scattered radiation, use of cones, diaphragm light beam devices and effectiveness of collimation in reducing effects of scatter. Effects of scatter radiation on radiograph image quality, patient dose and occupational exposure.	**10 Hours**
Unit-2:	**Intensifying screens**: Structure and functions, common phosphors used, types, screen mounting, care and maintenance of film screen contact. Intensifying factor-speed and detail-crossover effect-resolution-mottle-reciprocity-screen asymmetry, cleaning. New phosphor technology-influence of kilo voltage. Photo-stimulable phosphor Imaging. **Cassettes**: Structure and function, Types-single, gridded, film holder-Design features and consideration with loading/unloading, Care and maintenance (cleaning).	**07 Hours**
Unit-3:	**Photochemistry**: Principles: Acidity, alkalinity, pH, the processing cycle, development, developer solution. Fixing, fixer solution, washing, drying replenishment, checking and adjusting-latent image formation--nature of development-constitution of developer development time-factors in the use of developer. Fixers-constitution of fixing solution factors affecting the fixer-replenishment of fixer-silver conservation-Drying-developer and fixer for automatic film processor-rinsing-washing and drying. Replenishment rates in manual and automatic processing-silver recovery-Auto and manual chemicals. **Film Processing: manual processing**-care of processing equipment-automatic process or manual VS automatic processing-principles and typical equipment Microprocessor controlled-Cine Processing-Daylight Systems-Processing faults-maintenance. **Automatic Film Processor** - Functions of various components. Film roller transport-transport time, film feed system. Importance and relation to temp, fixed and variable time cycles. Care and maintenance (cleaning routine and methods of cleaning).	**12 Hours**
	Radiographic image-components of image quality, Unsharpness in radiographic image contrast of the radiographic image-distinctness of the radiographic image-size, shape and spatial relationships.	**08**

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NOTE:-	*Course Outcomes of following Labs are covered in their respective theory courses.*	
Course Code: 14756	**SKILL ENHANCEMENT COURSE (SEC)-1** **B.Sc.RIT- SEMESTER-I** **Human Anatomy I (Lab)**	L-0 T-0 P-2 C-1
Course Content:		
1.	Demonstration of Major organs through models and permanent slides.	
2.	Demonstration of parts of circulatory system from models.	
3.	Demonstration of parts of respiratory system from models.	
4.	Demonstration of digestive system from models.	
5.	Demonstration of excretory system from models.	
6	Demonstration of structural differences between skeletal, smooth and cardiac muscles.	
9.	Demonstration of various bones	
10.	Demonstration of various joints	
11.	Demonstration of various parts of male & female reproductive system from model	

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Course Code: 14757	**SKILL ENHANCEMENT COURSE (SEC)-2** **B.Sc.RIT-SEMESTER-I**	L-0 T-0 P-2 C-1
	Human Physiology I (Lab)	
Course Content:		
1.	Microscope	
2.	Haemocytometer	
3.	Blood	
4.	RBC count	
5.	Hemoglobin	
6.	WBC count	
7.	Differential count	
8.	ESR	
9.	Determination of Blood Group & Rh type	
10.	Bleeding & Clotting time	
11.	Blood pressure	

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Course Code: 14758	SKILL ENHANCEMENT COURSE (SEC)-3 B.Sc.RIT-SEMESTER-I Bio-Chemistry-I(Lab)	L-0 T-0 P-2 C-1
Course Content:		
1.	Introduction and preparation of different types of solutions- Normal, Molar, Molal, %, g/l and mole fraction.	
2.	Preparation of 0.1 M Phosphate buffer of pH 7.2.	
3.	Determination of absorption maxima (λmax) of a Bromo-phenol blue.	
4.	Qualitative tests on carbohydrates to identify the nature of given sample.	
5.	Quantitative estimation of Total carbohydrate in given sample by Anthroone method.	
6.	Quantitative estimation of reducing sugar by 3',5'-Dinitrosalicylic acid (DNSA) method.	
7.	Quantitative estimation of proteins (viz. Folin-Phenol-Lowry method, Bradford method / UV method)	
8.	Quantitative estimation of nucleic acids by Diphenylamine (DPA) method	
9.	Determination of acid value of a given fat sample	
10.	Separation of amino acids by paper chromatography	

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Course Code: 14798	**SKILL ENHANCEMENT COURSE (SEC)-4** **B.Sc.RIT-SEMESTER-I** **Basic physics including Radiological physics- I (Lab)**	L-0 T-0 P-2 C-1
Course Content:		
1-	. Study with charts, models & power point presentations involving students to present and discuss.	
2-	Atomic Structures, Atomic Models, Circuits, Conductors, Semiconductors, Transistors, Amplifiers demonstration by charts, models & power point presentations.	
3-	. Electrostatic demonstration by charts, models & power point presentations.	
4-	. Magnetics demonstration by charts, models & power point presentations.	
5-	Sound & Heat demonstration by charts, models & power point presentations.	

Course Code: 14799	**SKILL ENHANCEMENT COURSE (SEC)-5** **B.Sc.RIT-SEMESTER-I**	L-0 T-0 P-2 C-1
Course Content:		
	RADIOGRAPHIC AND IMAGING PROCESSING TECHNIQUES **PRACTICALS** 1. X-ray tubes general features and mobile equipment. 2. Care and maintenance of X-ray equipment and image intensifier 3. To study effects of Kilo Voltage Peak (KVP) and Milli Ampere Second (MAS) 4. Test to check the x-ray films and screen contact in the cassette 5. Test to check light leakage in the cassette. 6. Test to check the safety of dark room. 7. Test to check the speed of intensifying screen. 8. Test to check the developing time and function. 9. To prepare a characteristic curve of a radiographic film. 10. To check the effect of safe light on exposed as well as unexposed x-ray film. 11. Silver recovery method 12. Image Processing 13. Processing Room	

(S. Bhatnagar) (Tabassum Fatima) (Nidhi Singh) (Manisha Saxena) (Dr. P. Kannoji)

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Course Outcome B.Sc. MLT

Semester	Course Name	Course Outcomes (COs)
I	Human Anatomy-I	CO1: Describe structure & function of body systemsCO2: Identify anatomical featuresCO3: Explain clinical anatomical termsCO4: Correlate with physiology
I	Human Physiology-I	CO1: Explain normal physiology at cellular/systemic levelCO2: Use basic diagnostic toolsCO3: Correlate with anatomyCO4: Explain homeostasis mechanisms
I	Principles of Biochemistry-I	CO1: Understand biomoleculesCO2: Explain metabolic pathwaysCO3: Link biochemistry to diseaseCO4: Apply techniques in clinical biochemistry
I	Basic Microbiology-I	CO1: Classify microbesCO2: Explain microbes in diseaseCO3: Perform aseptic techniquesCO4: Interpret microbiological tests
I	Basic Pathology-I	CO1: Understand general pathologyCO2: Identify cellular injury & repairCO3: Explain inflammation & neoplasiaCO4: Link pathology with clinical features
I	Basic Computer and Information Science	CO1: Use basic computer applicationsCO2: Understand data handlingCO3: Apply digital toolsCO4: Communicate digitally
II	Human Anatomy-II	CO1: Identify anatomical features of different body systemsCO2: Understand structural and functional relationship of organs
II	Human Physiology-II	CO1: Explain physiological functions in detailCO2: Understand interactions between systemsCO3: Correlate with clinical practices
II	Principles of Biochemistry-II	CO1: Explore advanced biochemical processesCO2: Understand enzyme function and kineticsCO3: Relate biochemistry to pathology
II	Basic Microbiology-II	CO1: Identify and classify microorganismsCO2: Understand microbial pathogenesisCO3: Conduct microbiological techniques
II	Basic Pathology-II	CO1: Study cellular changes in diseaseCO2: Understand tissue responsesCO3: Correlate pathology with clinical signs
II	English & Communication Skills	CO1: Improve verbal & written communication skillsCO2: Apply medical terminologyCO3: Effectively interact in medical settings
III	Applied Clinical Biochemistry-I	CO1: Perform clinical biochemical testsCO2: Interpret lab resultsCO3: Analyze data and correlate with diseases

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Semester	Course Name	Course Outcomes (COs)
III	Systemic Bacteriology	CO1: Identify and categorize bacteriaCO2: Conduct diagnostic bacteriologyCO3: Understand clinical relevance of bacteria
III	Basics of Haematological Diseases-I	CO1: Explain blood disordersCO2: Identify causes of blood diseasesCO3: Conduct laboratory tests for hematological conditions
III	Fundamentals of Histopathology	CO1: Understand tissue processingCO2: Identify tissue morphologyCO3: Apply histopathology techniques
III	Introduction to Quality and Patient Safety	CO1: Understand quality assurance in labsCO2: Implement safety protocolsCO3: Identify potential errors and risks
IV	Applied Clinical Biochemistry-II	CO1: Perform advanced biochemical testsCO2: Ensure accuracy and quality controlCO3: Correlate biochemical results with diseases
IV	Applied Bacteriology	CO1: Conduct advanced bacterial analysisCO2: Interpret bacterial growth and response to treatments
IV	Medical Parasitology & Entomology	CO1: Identify parasites and vectorsCO2: Understand life cyclesCO3: Perform diagnostic techniques for parasitic infections
IV	Basics of Haematological Diseases-II	CO1: Diagnose blood disordersCO2: Identify pathological changesCO3: Analyze blood samples for diagnostic purposes
IV	Cytopathology & Cytotechniques	CO1: Perform cytology testingCO2: Recognize abnormal cell morphologyCO3: Apply cytotechnology in diagnostics
IV	Basic Preventive Medicine & Community Health Care	CO1: Understand disease prevention strategiesCO2: Conduct epidemiological surveysCO3: Apply health promotion practices
V	Analytical Clinical Biochemistry	CO1: Perform complex biochemical analysisCO2: Use automated systems in clinical testingCO3: Link biochemical results with clinical diagnosis
V	Immunology & Bacterial Serology	CO1: Understand immune responsesCO2: Perform serological testsCO3: Apply immunological techniques in diagnostics
V	Principles of Laboratory Management	CO1: Apply management techniques in the laboratoryCO2: Ensure laboratory efficiency and safetyCO3: Manage resources and personnel
V	Blood Banking and Genetics	CO1: Understand blood transfusion processesCO2: Analyze blood group compatibilityCO3: Conduct genetic tests for inherited diseases
V	Applied Histopathology-I	CO1: Conduct tissue preparation and stainingCO2: Identify disease in tissue sectionsCO3: Apply histopathological techniques



Semester	Course Name	Course Outcomes (COs)
V	Research Methodology & Biostatistics	CO1: Formulate research questionsCO2: Design research methodologiesCO3: Apply statistical methods for data analysis
V	Clinical Endocrinology & Toxicology	CO1: Understand endocrine functions and disordersCO2: Study toxicity in clinical settingsCO3: Conduct tests on endocrine and toxicological disorders
VI	Medical Mycology & Clinical Virology	CO1: Identify fungal and viral pathogensCO2: Perform diagnostic virology testsCO3: Understand mycological and virological diseases
VI	Immunopathology & Molecular Biology	CO1: Understand immune system disordersCO2: Conduct molecular diagnostic techniquesCO3: Apply immunology in clinical diagnosis
VI	Applied Haematology	CO1: Perform advanced hematology testsCO2: Interpret complex hematological resultsCO3: Apply knowledge in transfusion medicine
VI	Applied Histopathology-II	CO1: Perform advanced histopathology proceduresCO2: Interpret tissue samplesCO3: Correlate histopathology with clinical features
VI	Environmental Sciences	CO1: Understand environmental health principlesCO2: Identify environmental hazardsCO3: Implement sustainable practices



Course Outcome B.Sc. RIT

Semester	Subject	Course Outcomes (COs)
I	Human Anatomy-I	CO1: Identify and describe anatomical structures.CO2: Explain basic body systems.CO3: Correlate structure with function.CO4: Apply anatomical knowledge clinically.
I	Human Physiology-I	CO1: Understand basic physiological processes.CO2: Relate physiology to homeostasis.CO3: Measure basic physiological parameters.CO4: Explain organ system functions.
I	Radiological Physics-I	CO1: Explain fundamental physics concepts.CO2: Understand X-ray generation.CO3: Describe radiation units.CO4: Relate physics to radiological practices.
I	Radiographic & Imaging Processing Techniques	CO1: Understand film processing techniques.CO2: Operate darkroom equipment.CO3: Identify image artifacts.CO4: Apply image enhancement methods.
I	Basic Computer and Information Science	CO1: Use computer software applications.CO2: Apply data handling skills.CO3: Manage medical records digitally.CO4: Communicate using IT tools.
II	Human Anatomy-II	CO1: Identify internal organs and systems.CO2: Understand regional anatomy.CO3: Correlate structure with pathology.CO4: Interpret anatomical diagrams.
II	Human Physiology-II	CO1: Explain integrated body functions.CO2: Assess physiological changes.CO3: Apply knowledge to clinical settings.CO4: Monitor vital signs.
II	Radiological Physics-II	CO1: Understand advanced radiation physics.CO2: Explain dosimetry and radiation interactions.CO3: Describe radiation protection principles.CO4: Operate radiological instruments.
II	Conventional Radiography and Imaging Techniques	CO1: Perform conventional imaging techniques.CO2: Understand basic radiography equipment.CO3: Follow positioning protocols.CO4: Ensure patient safety.
II	Clinical Radiographic Positioning	CO1: Position patients for various projections.CO2: Identify positioning errors.CO3: Understand anatomical landmarks.CO4: Apply radiation safety measures.
II	English & Communication Skills	CO1: Demonstrate professional communication.CO2: Write reports effectively.CO3: Use medical terminology.CO4: Interact confidently with patients and staff.
III	Radiation Safety in Diagnostic Radiology-I	CO1: Understand radiation hazards.CO2: Apply protection measures.CO3: Follow safety protocols.CO4: Maintain exposure records.
III	Pathology	CO1: Explain disease mechanisms.CO2: Recognize pathological conditions on imaging.CO3: Correlate

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Semester	Subject	Course Outcomes (COs)
		imaging with clinical pathology.CO4: Use pathology in diagnosis.
III	Contrast & Special Radiography Procedures	CO1: Understand contrast media types.CO2: Perform contrast procedures.CO3: Handle complications.CO4: Apply special imaging protocols.
III	Clinical Radiographic Positioning-II	CO1: Position for complex examinations.CO2: Recognize anatomical variations.CO3: Modify techniques for trauma cases.CO4: Ensure image quality and safety.
III	Modern Radiological & Imaging Equipment	CO1: Describe advanced imaging machines.CO2: Operate modern radiology equipment.CO3: Understand equipment maintenance.CO4: Ensure quality control.
III	Research Methodology and Biostatistics	CO1: Develop research questions.CO2: Design research studies.CO3: Apply basic biostatistics.CO4: Interpret and present data.
IV	Radiation Safety in Diagnostic Radiology-II	CO1: Use radiation protection devices.CO2: Understand regulatory compliance.CO3: Monitor radiation doses.CO4: Educate others about safety.
IV	Techniques Including Patient Care-I	CO1: Provide basic patient care.CO2: Prepare patients for imaging.CO3: Ensure comfort and safety.CO4: Maintain ethical standards in handling patients.
IV	Newer Modalities of Radiology	CO1: Understand emerging imaging techniques.CO2: Operate new equipment safely.CO3: Interpret images from modern modalities.CO4: Update knowledge continuously.
IV	Quality Control in Radiology and Radiation Safety-I	CO1: Perform quality assurance tests.CO2: Maintain imaging standards.CO3: Identify deviations in performance.CO4: Record and report QC findings.
IV	Introduction to Environment Science	CO1: Understand ecological concepts.CO2: Analyze environmental hazards.CO3: Promote sustainable practices.CO4: Apply environmental ethics in healthcare.
V	Techniques in Advanced Imaging Technology-I	CO1: Apply CT and MRI techniques.CO2: Operate imaging software.CO3: Analyze cross-sectional anatomy.CO4: Perform patient positioning for advanced imaging.
V	Advanced Radiographic Techniques	CO1: Perform radiography for trauma, pediatric, and special cases.CO2: Modify standard techniques.CO3: Ensure diagnostic quality.CO4: Apply post-processing tools.
V	Patient Care & Practice-I	CO1: Understand patient rights and consent.CO2: Manage emergency protocols.CO3: Communicate empathetically.CO4: Monitor patient during procedures.

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Semester	Subject	Course Outcomes (COs)
V	Medical Law & Ethics	CO1: Understand medico-legal responsibilities.CO2: Apply ethics in radiology practice.CO3: Handle informed consent.CO4: Respect patient confidentiality.
VI	Techniques in Advanced Imaging Technology-II	CO1: Use PET, SPECT, and ultrasound imaging.CO2: Understand hybrid imaging modalities.CO3: Interpret complex scans.CO4: Ensure equipment safety standards.
VI	Advanced Imaging Techniques-II	CO1: Perform functional imaging studies.CO2: Use 3D reconstruction tools.CO3: Apply contrast in MRI/CT safely.CO4: Assess imaging for pathology.
VI	Patient Care & Practice-II	CO1: Perform advanced patient care.CO2: Manage critical situations.CO3: Document clinical information accurately.CO4: Apply infection control measures.
VI	Record & Control in Radiology and Radiation-II	CO1: Maintain accurate imaging records.CO2: Follow documentation standards.CO3: Ensure traceability of exposures.CO4: Comply with audits and inspections.



Course Outcome BPT

Semester	Subject Name	Type	Course Outcomes (COs)
1st	Human Anatomy-I	Theory	Describe anatomical terminology, systems and structures.
1st	Human Physiology-I	Theory	Understand physiological mechanisms and functions.
1st	Biochemistry	Theory	Explain biochemical structure and function of biomolecules.
1st	General & Clinical Psychology	Theory	Apply psychology concepts to patient care.
1st	English Communication & Soft Skills	Subsidiary	Improve communication and interpersonal skills.
1st	Basic Computer and Information Science	Subsidiary	Operate basic computer applications relevant to healthcare.
1st	Human Anatomy-I	Practical	Identify structures and landmarks on models/specimens.
1st	Human Physiology-I	Practical	Measure and interpret basic physiological parameters.
1st	Biochemistry	Practical	Perform biochemical tests and interpret results.
2nd	Human Anatomy-II	Theory	Explain detailed anatomy of limbs, thorax, and abdomen.
2nd	Human Physiology-II	Theory	Understand physiology of nervous, endocrine, and reproductive systems.
2nd	Basic Principles of Biomechanics	Theory	Understand human movement principles.
2nd	Sociology	Theory	Explain social structures and health relationships.
2nd	Introduction to Health Care Delivery System in India	Subsidiary	Describe healthcare delivery mechanisms in India.
2nd	Human Anatomy-II	Practical	Demonstrate anatomical structures in dissection/model.
2nd	Human Physiology-II	Practical	Apply physiological concepts through lab exercises.
2nd	Basic Principles of Biomechanics	Practical	Demonstrate basic biomechanical analysis.
3rd	Pathology	Theory	Describe mechanisms and diagnosis of disease processes.
3rd	Microbiology	Theory	Understand microbial structure, growth, and laboratory techniques.
3rd	Biomechanics & Kinesiology	Theory	Analyze human movement patterns.

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3rd	Foundation of Exercise Therapy	Theory	Describe princi exercise.
3rd	Electrotherapy I	Theory	Understand prin frequency electr
3rd	Introduction to Quality & Patient Safety	Subsidiary	Apply quality a clinical settings
3rd	Biomechanics & Kinesiology	Practical	Demonstrate m
3rd	Foundation of Exercise Therapy	Practical	Apply exercise practice.
3rd	Electrotherapy I	Practical	Apply electroth practical sessio
4th	Systemic Pathology	Theory	Understand sys pathology.
4th	Pharmacology	Theory	Understand dru uses.
4th	Biophysics	Theory	Apply physical physiological c
4th	Microbiology	Theory	Apply microbio clinical setting
4th	Electrotherapy II	Theory	Understand hig advanced electr
4th	Exercise Therapy	Theory	Apply progress therapeutic exe
4th	Environmental Science	Subsidiary	Understand env hazards.
4th	Electrotherapy	Practical	Practice advan techniques.
4th	Exercise Therapy	Practical	Demonstrate e different condi
5th	Clinical Orthopaedics & Traumatology I	Theory	Understand ort diagnostics, an
5th	Clinical Neurology & Neurosurgery I	Theory	Recognize neu their surgical i
5th	General Surgery	Theory	Apply surgical care.
5th	Obstetrics & Gynaecology	Theory	Understand re obstetric care.
5th	General Medicine	Theory	Diagnose and medical condi
5th	Health Promotion, Fitness & Wellness	Subsidiary	Promote fitne principles.
5th	Clinical Orthopaedics & Traumatology	Practical	Demonstrate examination s

5th	General Surgery	Practical	Perform basic surgical patient assessments.
6th	Clinical Orthopaedics & Traumatology II	Theory	Advanced understanding of orthopedic rehabilitation.
6th	Clinical Neurology & Neurosurgery	Theory	Understand neurological rehab and neurosurgical implications.
6th	Clinical Neurology & Neurosurgery II	Theory	Apply clinical reasoning in neurology cases.
6th	Clinical Cardiovascular & Pulmonary Conditions	Theory	Manage cardiac and pulmonary conditions in PT.
6th	Clinical Cardiovascular & Pulmonary Conditions (Revised)	Theory	Updated approaches in cardiac and pulmonary PT.
6th	Community Medicine	Theory	Understand public health and community interventions.
6th	Biostatistics and Research Methodology	Theory	Conduct and interpret basic research in PT.
6th	Physiotherapy Laws & Ethics, Professionalism & Values	Subsidiary	Adhere to legal and ethical principles in PT practice.
6th	Clinical Neurology & Neurosurgery	Practical	Apply neurological assessment techniques.
6th	Clinical Cardiovascular and Pulmonary Conditions	Practical	Implement cardio-pulmonary physiotherapy.
7th	Physiotherapy in Orthopaedics and Sports	Theory	Design sports injury rehab plans.
7th	Physiotherapy in Orthopaedics & Sports I	Theory	Basic principles of ortho-sports PT.
7th	Physiotherapy in General Medicine	Theory	Rehabilitate general medical conditions.
7th	Physiotherapy in Neurology	Theory	Manage neuro-rehabilitation cases.
7th	Diagnostic Imaging for Physiotherapist	Theory	Interpret basic imaging in PT context.
7th	Human Psychiatry	Theory	Understand psychiatric disorders relevant to PT.
7th	Principles of Management	Subsidiary	Apply management principles in clinical settings.
7th	Physiotherapy in Orthopaedics & Sports	Practical	Execute ortho-sports PT techniques.
7th	Physiotherapy in Orthopaedics & Sports I	Practical	Basic ortho-sports practical applications.
7th	Physiotherapy in Neurology	Practical	Perform neuro PT interventions.
8th	Physiotherapy in Orthopaedics & Sports II	Theory	Advanced sports and ortho rehab techniques.

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8th	Physiotherapy in Cardiovascular & Intensive Care	Theory	Manage ICU and cardiovascular rehab cases.
8th	Physiotherapy in General Medicine & General Surgery	Theory	Integrate PT in medicine and surgery.
8th	Physiotherapy in General Surgery	Theory	Specific rehab strategies for surgical patients.
8th	Community Physiotherapy	Theory	Provide PT in community settings.
8th	Community Physiotherapy (Revised)	Theory	Updated approaches in community PT.
8th	Clinical Reasoning and Evidence Based Physiotherapy	Theory	Apply EBP and clinical decision making.
8th	Administration & Teaching Skills	Subsidiary	Manage PT departments and teach effectively.
8th	Physiotherapy in Cardiovascular & Intensive Care	Practical	Practical ICU and cardiac rehab skills.
8th	Physiotherapy in General Medicine & General Surgery	Practical	Apply PT in medical/surgical settings.

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ourse Outcome B.SC. Opt.

Title	Course Outcome (CO)
ny	Understand the structure and functions of the human body systems.
ogy	Comprehend physiological processes and their role in maintaining homeostasis.
mistry	Analyze biochemical principles involved in cellular metabolism and energy production.
tics-I	Explain the principles of light, reflection, refraction, and their application in optical systems.
	Understand the role of nutrients in human health and develop an understanding of balanced diets for optimal health.
uters	Gain knowledge in computer fundamentals, operating systems, and software applications relevant to medical technology.
	Develop communication skills necessary for professional settings, focusing on medical terminology and patient interaction.
y	Understand the structure of the eye and its various components critical for visual function.
gy	Learn the physiological processes involved in vision and the functioning of ocular systems.
nistry	Analyze the biochemical pathways involved in vision and ocular health.
	Understand the behavior of light and optical properties in various media.
tics-II	Apply advanced principles of geometrical optics, including lens systems and optical instruments.
Sciences	Understand the impact of environmental factors on health and the role of optometry in public health.
etry-I	Gain practical knowledge in performing basic optometric assessments and diagnoses.
iology	Learn about microbial infections affecting the ocular system and their treatment.
I	Understand the principles of image formation, accommodation, and visual processing.
tics-I	Comprehend the principles of optical devices, such as lenses and prisms, in optometric practice.
struments	Learn to use optometric instruments for measuring visual acuity, refractive errors, and other ocular health indicators.

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emester	Course Title	Course Outcome (CO)
I	Ocular Disease-I	Understand common ocular diseases, their pathophysiology, and management strategies.
I	Clinical Examination of Visual System	Gain hands-on experience in conducting clinical examinations of the visual system to diagnose various eye conditions.
I	Indian Medicine and Telemedicine	Understand traditional Indian medicine approaches in ocular care and the role of telemedicine in optometry.
I	Clinical Optometry-II	Develop advanced skills in clinical optometry, focusing on patient care and complex diagnostic techniques.
I	Optometric Optics-II & Dispensing Optics	Gain expertise in dispensing optical aids and correcting refractive errors with advanced optometric devices.
V	Visual Optics-II	Understand advanced concepts in visual processing and the correction of visual impairments.
V	Ocular Disease-II and Glaucoma	Learn about complex ocular diseases, particularly glaucoma, and strategies for prevention and management.
V	Pathology	Understand pathological changes in ocular tissues and their impact on vision.
V	Basic and Ocular Pharmacology	Study the pharmacological treatments used in ocular conditions and their mechanisms of action.
V	Introduction to Quality & Patient Safety	Understand the principles of quality management in healthcare settings, focusing on patient safety and care standards.
V	Medical Psychology	Learn about the psychological aspects of healthcare, including patient behavior, communication, and coping strategies.
V	Contact Lens-I	Understand the basics of contact lens fitting, types, and patient care procedures.
V	Low Vision Care	Gain knowledge in assessing and managing patients with low vision, focusing on rehabilitation techniques.
V	Geriatric Optometry & Pediatric Optometry	Learn the unique considerations for providing optometric care to geriatric and pediatric populations.
V	Binocular Vision-I	Understand the physiology and pathophysiology of binocular vision and the assessment of binocular function.
V	Systemic Disease	Comprehend the relationship between systemic diseases and their impact on ocular health.
V	Research Methodology & Biostatistics	Learn the fundamentals of research methods, including biostatistics, for evidence-based practice in optometry.

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Semester	Course Title	Course Outcome (CO)
V	Clinical Optometry-IV	Develop advanced clinical skills in optometry, focusing on specialized assessments and patient management.
VI	Contact Lens-II	Gain expertise in advanced contact lens fitting, including therapeutic lenses and specialty lens designs.
VI	Binocular Vision-II	Explore advanced aspects of binocular vision, including diagnostic techniques and therapeutic interventions.
VI	Public Health & Community Optometry	Understand the role of optometry in public health, including community-based eye care programs and health education.

VI	14123	Practice Management	Understand and apply practice management skills, including patient scheduling and records management.
VI	14124	Occupational Optometry	Understand the role of optometry in the workplace, including vision screening and ergonomic assessments.
VI	14119	Medical Law and Ethics	Learn the principles of medical law, ethics, and professional responsibility in optometry practice.
VI	14753	Research Project – I	Conduct basic optometry-related research, developing skills in data collection and analysis.
VI	14754	Clinical Optometry	Develop practical skills in the diagnosis and treatment of ocular conditions in a clinical setting.



3	2	0	0	0	0	3	3	0
3	3	0	0	3	0	0	3	0
0	3	0	0	0	3	3	0	0
3	3	0	0	0	0	3	0	0



Sem	Course Name	Course Outcomes (COs)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
		CO3: Explain inflammation & neoplasia CO4: Link pathology with clinical features										
I	Basic Computer and Information Science	CO1: Use basic computer applications CO2: Understand data handling CO3: Apply digital tools CO4: Communicate digitally	0	0	0	3	0	3	0	0	0	0
II	Human Anatomy-II	CO1: Identify anatomical features of different body systems CO2: Understand structural and functional relationship of organs	3	3	2	3	0	0	0	0	0	0
II	Human Physiology-II	CO1: Explain physiological functions in detail CO2: Understand interactions between systems CO3: Correlate with clinical practices	3	3	3	0	0	0	3	3	0	0
II	Principles of Biochemistry-II	CO1: Explore advanced biochemical processes CO2: Understand enzyme function and kinetics CO3: Relate biochemistry to pathology	3	3	3	0	0	3	0	0	3	0
II	Basic Microbiology-II	CO1: Identify and classify microorganisms CO2: Understand microbial pathogenesis	3	0	3	0	0	0	3	3	0	0

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Sem	Course Name	Course Outcomes (COs)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
		CO3: Conduct microbiological techniques										
I	Basic Pathology-II	CO1: Study cellular changes in disease CO2: Understand tissue responses CO3: Correlate pathology with clinical signs	3	3	3	0	0	0	3	0	0	0
I	English & Communication Skills	CO1: Improve verbal & written communication skills CO2: Apply medical terminology CO3: Effectively interact in medical settings	3	0	0	3	0	0	0	0	3	0
II	Applied Clinical Biochemistry-I	CO1: Perform clinical biochemical tests CO2: Interpret lab results CO3: Analyze data and correlate with diseases	3	3	3	0	0	0	0	3	0	0
II	Systemic Bacteriology	CO1: Identify and categorize bacteria CO2: Conduct diagnostic bacteriology CO3: Understand clinical relevance of bacteria	3	3	3	0	0	0	0	3	0	0
III	Basics of Haematological Diseases-I	CO1: Explain blood disorders CO2: Identify causes of blood diseases CO3: Conduct laboratory tests for hematological conditions	3	3	3	0	0	0	0	3	0	0
III	Fundamentals of	CO1: Understand tissue processing CO2: Identify	3	3	3	0	0	0	0	3	0	0

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Course Name	Course Outcomes (COs)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
Histopathology	tissue morphology CO3: Apply histopathology techniques										
Introduction to Quality and Patient Safety	CO1: Understand quality assurance in labs CO2: Implement safety protocols CO3: Identify potential errors and risks	0	3	0	0	3	0	0	0	0	0
Applied Clinical Biochemistry-II	CO1: Perform advanced biochemical tests CO2: Ensure accuracy and quality control CO3: Correlate biochemical results with diseases	3	3	3	0	0	0	0	3	0	0
Applied Bacteriology	CO1: Conduct advanced bacterial analysis CO2: Interpret bacterial growth and response to treatments	3	0	3	0	0	0	0	3	0	0
Medical Parasitology & Entomology	CO1: Identify parasites and vectors CO2: Understand life cycles CO3: Perform diagnostic techniques for parasitic infections	3	3	3	0	0	0	0	3	0	0
Basics of Haematological Diseases-II	CO1: Diagnose blood disorders CO2: Identify pathological changes CO3: Analyze blood samples for diagnostic purposes	3	3	3	0	0	0	0	3	0	0
Cytopathology & Cytotechniques	CO1: Perform cytology testing CO2: Recognize abnormal cell	3	3	0	0	0	0	3	0	0	0

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Sem	Course Name	Course Outcomes (COs)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
		morphology CO3: Apply cytotechnology in diagnostics										
IV	Basic Preventive Medicine & Community Health Care	CO1: Understand disease prevention strategies CO2: Conduct epidemiological surveys CO3: Apply health promotion practices	0	3	3	0	0	0	3	0	0	3
V	Analytical Clinical Biochemistry	CO1: Perform complex biochemical analysis CO2: Use automated systems in clinical testing CO3: Link biochemical results with clinical diagnosis	3	3	0	0	0	3	0	3	0	0
V	Immunology & Bacterial Serology	CO1: Understand immune responses CO2: Perform serological tests CO3: Apply immunological techniques in diagnostics	3	3	0	0	0	0	0	3	0	0
V	Principles of Laboratory Management	CO1: Apply management techniques in the laboratory CO2: Ensure laboratory efficiency and safety CO3: Manage resources and personnel	3	3	0	3	3	0	0	0	0	0
V	Blood Banking and Genetics	CO1: Understand blood transfusion processes CO2: Analyze blood group compatibility CO3: Conduct	3	0	3	0	0	0	0	3	0	0

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Course Name	Course Outcomes (COs)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
	genetic tests for inherited diseases										
Applied Histopathology-I	CO1: Conduct tissue preparation and staining CO2: Identify disease in tissue sections CO3: Apply histopathological techniques	3	3	3	0	0	0	0	3	0	0
Research Methodology & Biostatistics	CO1: Formulate research questions CO2: Design research methodologies CO3: Apply statistical methods for data analysis	3	0	0	3	3	0	0	3	0	0
Clinical Endocrinology & Toxicology	CO1: Understand endocrine functions and disorders CO2: Study toxicity in clinical settings CO3: Conduct tests on endocrine and toxicological disorders	3	3	0	0	0	0	3	0	0	3
Medical Mycology & Clinical Virology	CO1: Identify fungal and viral pathogens CO2: Perform diagnostic virology tests CO3: Understand mycological and virological diseases	3	3	0	0	0	0	3	0	0	0
Immunopathology & Molecular Biology	CO1: Understand immune system disorders CO2: Conduct molecular diagnostic techniques CO3: Apply immunology in clinical diagnosis	3	3	3	0	0	0	3	0	0	0

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Sem	Course Name	Course Outcomes (COs)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
VI	Applied Haematology	CO1: Perform advanced hematology tests CO2: Interpret complex hematological results CO3: Apply knowledge in transfusion medicine	3	3	3	0	0	0	0	3	0	0
VI	Applied Histopathology-II	CO1: Perform advanced histopathology procedures CO2: Interpret tissue samples CO3: Correlate histopathology with clinical features	3	3	3	0	0	0	3	3	0	0
VI	Environmental Sciences	CO1: Understand environmental health principles CO2: Identify environmental hazards CO3: Implement sustainable practices	3	0	0	0	3	3	0	0	3	0



CO PO Mapping of BRIT

Sem	Subject	Course Outcomes (COs)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
	Human Anatomy-I	CO1: Identify and describe anatomical structures.	3	2	2	2	1	2	1	1	3
		CO2: Explain basic body systems.									
		CO3: Correlate structure with function.									
		CO4: Apply anatomical knowledge clinically.									
	Human Physiology-I	CO1: Understand basic physiological processes.	3	2	2	2	1	2	1	1	3
		CO2: Relate physiology to homeostasis.									
		CO3: Measure basic physiological parameters.									
		CO4: Explain organ system functions.									
	Radiological Physics-I	CO1: Explain fundamental physics concepts.	3	3	1	1	3	2	1	1	3
		CO2: Understand X-ray generation.									
		CO3: Describe radiation units.									
		CO4: Relate physics to radiological practices.									
	Radiographic & Imaging Processing Techniques	CO1: Understand film processing techniques.	3	3	2	2	2	2	1	1	3
		CO2: Operate darkroom equipment.									



em	Subject	Course Outcomes (COs)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
		CO3: Identify image artifacts.									
		CO4: Apply image enhancement methods.									
	Basic Computer and Information Science	CO1: Use computer software applications.	2	2	2	3	2	2	2	1	3
		CO2: Apply data handling skills.									
		CO3: Manage medical records digitally.									
		CO4: Communicate using IT tools.									
	Human Anatomy-II	CO1: Identify internal organs and systems.	3	2	2	2	1	2	1	1	3
		CO2: Understand regional anatomy.									
		CO3: Correlate structure with pathology.									
		CO4: Interpret anatomical diagrams.									
I	Human Physiology-II	CO1: Explain integrated body functions.	3	2	2	2	1	2	1	1	3
		CO2: Assess physiological changes.									
		CO3: Apply knowledge to clinical settings.									
		CO4: Monitor vital signs.									
II	Radiological Physics-II	CO1: Understand advanced radiation physics.	3	3	1	1	3	2	1	1	3
		CO2: Explain dosimetry and radiation interactions.									



Sem	Subject	Course Outcomes (COs)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
		CO3: Describe radiation protection principles.									
		CO4: Operate radiological instruments.									
II	Conventional Radiography and Imaging Techniques	CO1: Perform conventional imaging techniques.	3	3	2	2	3	3	1	2	3
		CO2: Understand basic radiography equipment.									
		CO3: Follow positioning protocols.									
		CO4: Ensure patient safety.									
II	Clinical Radiographic Positioning	CO1: Position patients for various projections.	3	3	2	2	3	2	1	2	3
		CO2: Identify positioning errors.									
		CO3: Understand anatomical landmarks.									
		CO4: Apply radiation safety measures.									
II	English & Communication Skills	CO1: Demonstrate professional communication.	3	3	2	2	1	1	2	2	3
		CO2: Write reports effectively.									
		CO3: Use medical terminology.									
		CO4: Interact confidently with patients and staff.									

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Course fulfilled Local, National, Social, Regional and Global development need
Program Name: BPT

Subject	Local	Regional	Social	National	Global
Human Anatomy	✓	✓	✓	✓	✓
Human Physiology	✓	✓	✓	✓	✓
Biochemistry	✓	✓	✓	✓	✓
Psychology	✓	✓	✓	✓	✓
Sociology	✓	✓	✓	✓	✓
Exercise Therapy	✓	✓	✓	✓	✓
Electrotherapy	✓	✓	✓	✓	✓
Biomechanics & Kinesiology	✓	✓	✓	✓	✓
Pathology	✓	✓	✓	✓	✓
Microbiology	✓	✓	✓	✓	✓
Pharmacology	✓	✓	✓	✓	✓
General Medicine	✓	✓	✓	✓	✓
General Surgery	✓	✓	✓	✓	✓
Orthopaedics and Traumatology	✓	✓	✓	✓	✓
Orthopaedic Physiotherapy	✓	✓	✓	✓	✓
Neurology and Neurosurgery	✓	✓	✓	✓	✓
Neuro Physiotherapy	✓	✓	✓	✓	✓
Community Based Rehabilitation	✓	✓	✓	✓	✓
Cardiovascular & Respiratory Conditions	✓	✓	✓	✓	✓
Cardio-Respiratory Physiotherapy	✓	✓	✓	✓	✓
Pediatrics & Geriatrics	✓	✓	✓	✓	✓
Pediatric Physiotherapy	✓	✓	✓	✓	✓
Geriatric Physiotherapy	✓	✓	✓	✓	✓
Women's Health and Physiotherapy	✓	✓	✓	✓	✓

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Course fulfilled Local, National, Social, Regional and Global development need
Program Name: BPT

Subject	Local	Regional	Social	National	Global
Physiotherapy in Sports	✓	✓	✓	✓	✓
Physiotherapy in Burns and Plastic Surgery	✓	✓	✓	✓	✓
Professional Ethics & Administration	✓	✓	✓	✓	✓
Research Methodology & Biostatistics	✓	✓	✓	✓	✓
Disability Prevention & Rehabilitation	✓	✓	✓	✓	✓
Clinical Training / Internships	✓	✓	✓	✓	✓



Course fulfilled Local, National, Social, Regional and Global development need
Program Name: B.Sc. MLT

Subject	Local	Regional	Social	National	Global
Human Anatomy-I	✓	✓	✓	✓	✓
Human Physiology-I	✓	✓	✓	✓	✓
Principles of Biochemistry-I	✓	✓	✓	✓	✓
Basic Microbiology-I	✓	✓	✓	✓	✓
Basic Pathology-I	✓	✓	✓	✓	✓
Basic Computer and Information Science	✓	✓	✓	✓	✓
Human Anatomy-II	✓	✓	✓	✓	✓
Human Physiology-II	✓	✓	✓	✓	✓
Principles of Biochemistry-II	✓	✓	✓	✓	✓
Basic Microbiology-II	✓	✓	✓	✓	✓
Basic Pathology-II	✓	✓	✓	✓	✓
English & Communication Skills	✓	✓	✓	✓	✓
Applied Clinical Biochemistry-I	✓	✓	✓	✓	✓
Systemic Bacteriology	✓	✓	✓	✓	✓
Basics of Haematological Diseases-I	✓	✓	✓	✓	✓
Fundamentals of Histopathology	✓	✓	✓	✓	✓
Introduction to Quality and Patient Safety	✓	✓	✓	✓	✓
Applied Clinical Biochemistry-II	✓	✓	✓	✓	✓
Applied Bacteriology	✓	✓	✓	✓	✓
Medical Parasitology & Entomology	✓	✓	✓	✓	✓
Basics of Haematological Diseases-II	✓	✓	✓	✓	✓

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Course fulfilled Local, National, Social, Regional and Global development need
Program Name: B.Sc. MLT

Subject	Local	Regional	Social	National	Global
Cytopathology & Cytotechniques	✓	✓	✓	✓	✓
Basic Preventive Medicine & Community Health	✓	✓	✓	✓	✓
Analytical Clinical Biochemistry	✓	✓	✓	✓	✓
Immunology & Bacterial Serology	✓	✓	✓	✓	✓
Principles of Laboratory Management	✓	✓	✓	✓	✓
Blood Banking and Genetics	✓	✓	✓	✓	✓
Applied Histopathology-I	✓	✓	✓	✓	✓
Research Methodology & Biostatistics	✓	✓	✓	✓	✓
Clinical Endocrinology & Toxicology	✓	✓	✓	✓	✓
Medical Mycology & Clinical Virology	✓	✓	✓	✓	✓
Immunopathology & Molecular Biology	✓	✓	✓	✓	✓
Applied Haematology	✓	✓	✓	✓	✓
Applied Histopathology-II	✓	✓	✓	✓	✓
Environmental Sciences	✓	✓	✓	✓	✓



Course fulfilled Local, National, Social, Regional and Global development need
Program Name: B.Sc. RIT

Subject	Local	Regional	Social	National	Global
Human Anatomy-I	✓	✓	✓	✓	✓
Human Physiology-I	✓	✓	✓	✓	✓
Radiological Physics-I	✓	✓	✓	✓	✓
Radiographic & Imaging Processing Techniques	✓	✓	✓	✓	✓
Basic Computer and Information Science	✓	✓	✓	✓	✓
Human Anatomy-II	✓	✓	✓	✓	✓
Human Physiology-II	✓	✓	✓	✓	✓
Radiological Physics-II	✓	✓	✓	✓	✓
Conventional Radiography and Imaging Techniques	✓	✓	✓	✓	✓
Clinical Radiographic Positioning	✓	✓	✓	✓	✓
English & Communication Skills	✓	✓	✓	✓	✓
Radiation Safety in Diagnostic Radiology-I	✓	✓	✓	✓	✓
Pathology	✓	✓	✓	✓	✓
Contrast & Special Radiography Procedures	✓	✓	✓	✓	✓
Clinical Radiographic Positioning-II	✓	✓	✓	✓	✓
Modern Radiological & Imaging Equipment	✓	✓	✓	✓	✓
Research Methodology and Biostatistics	✓	✓	✓	✓	✓
Radiation Safety in Diagnostic Radiology-II	✓	✓	✓	✓	✓
Techniques including Patient Care-I	✓	✓	✓	✓	✓
Newer Modalities of Radiology	✓	✓	✓	✓	✓

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Course fulfilled Local, National, Social, Regional and Global development need
Program Name: B.Sc. RIT

Subject	Local	Regional	Social	National	Global
Quality Control in Radiology and Radiation Safety-I	✓	✓	✓	✓	✓
Introduction to Environment Science	✓	✓	✓	✓	✓
Techniques in Advanced Imaging Technology-I	✓	✓	✓	✓	✓
Advanced Radiographic Techniques	✓	✓	✓	✓	✓
Patient Care & Practice-I	✓	✓	✓	✓	✓
Medical Law & Ethics	✓	✓	✓	✓	✓
Techniques in Advanced Imaging Technology-II	✓	✓	✓	✓	✓
Advanced Imaging Techniques-II	✓	✓	✓	✓	✓
Patient Care & Practice-II	✓	✓	✓	✓	✓
Record & Control in Radiology and Radiation-II	✓	✓	✓	✓	✓

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rse fulfilled Local, National, Social, Regional and Global development need

Program Name: B.Sc. Opt.

Paper Name	Local	Regional	Social	National	Global
Anatomy	✓	✓	✓	✓	✓
Physiology	✓	✓	✓	✓	✓
l Biochemistry	✓	✓	✓	✓	✓
etrical Optics-I	✓	✓	✓	✓	✓
tion	✓	✓	✓	✓	✓
cs of Computers	✓	✓	✓	✓	✓
glish and Communication	✓	✓	✓	✓	✓
cular Anatomy	✓	✓	✓	✓	✓
Ocular Physiology	✓	✓	✓	✓	✓
Ocular Biochemistry	✓	✓	✓	✓	✓
Physical Optics	✓	✓	✓	✓	✓
Geometrical Optics-II	✓	✓	✓	✓	✓
Environmental Sciences	✓	✓	✓	✓	✓
Clinical Optometry-I	✓	✓	✓	✓	✓
Ocular Microbiology	✓	✓	✓	✓	✓
Visual Optics-I	✓	✓	✓	✓	✓
Optometric Optics-I	✓	✓	✓	✓	✓
Optometric Instruments	✓	✓	✓	✓	✓
Ocular Disease-I	✓	✓	✓	✓	✓
Clinical Examination of Visual System	✓	✓	✓	✓	✓
Indian Medicine and Telemedicine	✓	✓	✓	✓	✓
Clinical Optometry-II	✓	✓	✓	✓	✓
Optometric Optics-II & Dispensing Optics	✓	✓	✓	✓	✓
Visual Optics-II	✓	✓	✓	✓	✓



Course fulfilled Local, National, Social, Regional and Global development need
Program Name: B.Sc. Opt.

Paper Name	Local	Regional	Social	National	Global
Ocular Disease-II and Glaucoma	✓	✓	✓	✓	✓
Pathology	✓	✓	✓	✓	✓
Basic and Ocular Pharmacology	✓	✓	✓	✓	✓
Introduction to Quality & Patient Safety	✓	✓	✓	✓	✓
Medical Psychology	✓	✓	✓	✓	✓
Contact Lens-I	✓	✓	✓	✓	✓
Low Vision Care	✓	✓	✓	✓	✓
Geriatric Optometry & Pediatric Optometry	✓	✓	✓	✓	✓
Binocular Vision-I	✓	✓	✓	✓	✓
Systemic Disease	✓	✓	✓	✓	✓
Research Methodology & Biostatistics	✓	✓	✓	✓	✓
Clinical Optometry-IV	✓	✓	✓	✓	✓
Contact Lens-II	✓	✓	✓	✓	✓
Binocular Vision-II	✓	✓	✓	✓	✓
Public Health & Community Optometry	✓	✓	✓	✓	✓

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