



**Bachelor of Cardiovascular Technology(BCVT)**

**Program code: SAH0108**

**(2021 - 2025)**

**Program and Course Structure**

**School of Allied Health Sciences**

## 1.1 Vision, Mission and Core Values of the University

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### **Vision of the University**

To serve the society by being a global University of higher learning in pursuit of academic excellence, innovation and nurturing entrepreneurship.

### **Mission of the University**

1. Transformative educational experience
2. Enrichment by educational initiatives that encourage global outlook
3. Develop research, support disruptive innovations and accelerate entrepreneurship
4. Seeking beyond boundaries

### **Core Values**

- Integrity
- Leadership
- Diversity
- Community

## **1.2 Vision and Mission of the School**

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### **Vision of the School**

To steer the School of Allied Health Sciences towards excellence in academics, innovation and entrepreneurship by constant endeavors

### **Mission of the School**

1. To create the state of the art facility for quality teaching learning, research & innovation
2. To incorporate the contemporary standards in teaching & learning
3. To inculcate in the students values of integrity and compassion towards the care of patients and society.

### **Core Values**

- Critical Thinking and Observation
- Analytical Skills
- Creativity
- Skilled professional
- Multidimensional
- Compassion
- Management

### 1.3 BCVTProgramme Educational Objectives (PEO)

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A under graduate student having qualified the BSc Cardiovascular Technology course should be able to:

PEO1 : B.Sc.CVT program enables students to become a trained, qualified cardiovascular technician capable of working independently or in association with a higher setup.

PEO2 : After the completion of program, candidates become well known in techniques such as Electrocardiography, Echocardiography, Treadmill test/Stress test, Doppler ultrasonography and contrast Echo.

PEO3 : Graduate will integrate knowledge and skills of cardiovascular technology to provide healthcare solutions for the benefit of the society.

PEO4 : After the completion of program, graduate become well-prepared for work associated with assisting cardiac surgeons, cardio -thoracic surgeons and cardiologists in tertiary care hospitals and others.

PEO5 : Graduate will be supportive, informative and providing in necessary information regarding good cardiac health for society and community and continuously improving his/ her knowledge and abilities.

PEO6 : Graduates will have a good leadership qualities and entrepreneur skills by working and communicating effectively in interdisciplinary environment, either independently or with a team.

#### 1.3.2 BCVTMap PEOs with Mission Statements:

| PEO Statements | School<br>Mission 1 | School<br>Mission 2 | School<br>Mission 3 |
|----------------|---------------------|---------------------|---------------------|
| PEO1:          | 2                   | 2                   | 2                   |
| PEO2:          | 3                   | 2                   | 3                   |

|              |          |          |          |
|--------------|----------|----------|----------|
| <b>PEO3:</b> | <b>3</b> | <b>3</b> | <b>3</b> |
| <b>PEO4:</b> | <b>2</b> | <b>2</b> | <b>3</b> |
| <b>PEO5:</b> | <b>2</b> | <b>3</b> | <b>3</b> |
| <b>PEO6:</b> | <b>2</b> | <b>2</b> | <b>3</b> |

### 1.3.3 BCVT Program Outcomes (PO's)

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PO1 : Define and describe human cardiovascular and its related system in relation to various disease.

PO2 : Distinguish and classify various cardiovascular disorder.

PO3 : Apply knowledge of human cardiovascular and its related system in the diagnosis, cardiovascular disorder, related disorder its management& apply the knowledge and skills to assess and solve societal and legal issues related to cardiovascular care of the patients

PO4 : Utilize modern tools and techniques in the field of cardiovascular technology for patient compliance.

PO5 : Tackle future challenges through lifelong learning and training process related to cardiac health.

PO6 : Evolve ethical practices and moral values in personal and professional endeavors.

PO7 : Regular learning the use of modern tools and techniques for the efficient management of cardiovascular diseases and related disorder.

PSO1 :B.Sc. CVT program enables students to understand disease, acquire skills regarding diagnosis and its management of various cardiac diseases.

PSO2 : The CVT's primary role is to perform maneuvers, diagnostic test according to direction

SU/SAHS/BCVT

of a qualified physician and helping him/ her in the diagnosis and treatment of cardiovascular injury and disease.

PSO3 : After completion of the program students will be able to apply specialized occupational theory, skills and concepts to work independently as qualified cardiovascular technologist and becomes an integral member of the cardiac cath. lab and electrophysiology labteams.

### 1.3.4 Mapping of Program Outcome Vs Program Educational Objectives

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|     | PEO1 | PEO2 | PEO3 | PEO4 | PEO5 | PEO6 |
|-----|------|------|------|------|------|------|
| PO1 | 2    | 3    | 3    | 2    | 3    | 2    |
| PO2 | 3    | 2    | 2    | 2    | 2    | 3    |
| PO3 | 2    | 3    | 2    | 2    | 2    | 3    |
| PO4 | 2    | 2    | 3    | 2    | 2    | 3    |
| PO5 | 2    | 2    | 2    | 2    | 3    | 3    |
| PO6 | 3    | 2    | 3    | 3    | 3    | 2    |
| PO7 | 2    | 3    | 2    | 2    | 3    | 3    |

|             |          |          |          |          |          |
|-------------|----------|----------|----------|----------|----------|
|             |          |          |          |          |          |
| <b>PSO1</b> | <b>2</b> | <b>3</b> | <b>3</b> | <b>2</b> | <b>2</b> |
| <b>PSO2</b> | <b>3</b> | <b>3</b> | <b>2</b> | <b>3</b> | <b>2</b> |
| <b>PSO3</b> | <b>2</b> | <b>3</b> | <b>3</b> | <b>2</b> | <b>3</b> |

### 1.3.5 BCVT Program Outcome Vs. Courses Mapping Table:

| Program Outcome Courses        | Course Name                                 | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|--------------------------------|---|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| <b>1<sup>st</sup> Semester</b> |   |     |     |     |     |     |     |     |      |      |      |
| Course 111                     | Human Anatomy - I                           | 2   | 3   | 2   | 3   | 3   | 2   | 3   | 2    | 2    | 2    |
| Course 112                     | Physiology - I                              | 2   | 2   | 3   | 3   | 2   | 3   | 3   | 2    | 2    | 1    |
| Course 113                     | Biochemistry – I                            | 3   | 2   | 3   | 2   | 3   | 2   | 3   | 3    | 2    | 2    |
| Course 114                     | Pathology- I                                | 3   | 2   | 2   | 3   | 3   | 2   | 2   | 1    | 3    | 3    |
| Course 115                     | Microbiology- I                             | 3   | 2   | 2   | 2   | 2   | 2   | 3   | 2    | 2    | 2    |
| Course 116                     | Basics of Hospital and data management-I    | 2   | 3   | 2   | 2   | 3   | 2   | 2   | 2    | 2    | 3    |
| <b>2<sup>ND</sup> Semester</b> |   |     |     |     |     |     |     |     |      |      |      |
| Course 211                     | Human Anatomy – II                          | 2   | 3   | 2   | 3   | 3   | 2   | 3   | 2    | 2    | 2    |
| Course 212                     | Physiology – II                             | 2   | 2   | 3   | 3   | 2   | 3   | 3   | 2    | 2    | 1    |
| Course 213                     | Biochemistry – II                           | 3   | 2   | 3   | 2   | 3   | 2   | 3   | 3    | 2    | 2    |
| Course 214                     | Pathology – II                              | 3   | 2   | 2   | 3   | 3   | 2   | 2   | 1    | 3    | 3    |
| Course 215                     | Microbiology – II                           | 3   | 2   | 2   | 2   | 2   | 2   | 3   | 2    | 2    | 2    |
| Course 216                     | Basics of Hospital and data management – II | 2   | 3   | 2   | 2   | 3   | 2   | 2   | 2    | 2    | 3    |
| <b>3<sup>RD</sup> Semester</b> |   |     |     |     |     |     |     |     |      |      |      |
| Course 311                     | Medicine                                    | 3   | 2   | 2   | 2   | 3   | 3   | 2   | 2    | 2    | 3    |

|                                |   |   |   |   |   |   |   |   |   |   |   |
|--------------------------------|---|---|---|---|---|---|---|---|---|---|---|
|                                | relevant to cardiac care technology - I           |   |   |   |   |   |   |   |   |   |   |
| Course 312                     | Applied Pathology - I                             | 2 | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 2 |
| Course 313                     | Applied Microbiology - I                          | 2 | 2 | 3 | 3 | 2 | 2 | 3 | 2 | 3 | 2 |
| Course 314                     | Applied Pharmacology- I                           | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 2 |
| Course 315                     | Introduction to Cardiac care Technology - I       | 2 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 |
| <b>4<sup>TH</sup> Semester</b> |   |   |   |   |   |   |   |   |   |   |   |
| Course 411                     | Medicine relevant to cardiac care technology – II | 3 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 3 |
| Course 412                     | Applied Pathology - II                            | 2 | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 2 |
| Course 413                     | Applied Microbiology – II                         | 2 | 2 | 3 | 3 | 2 | 2 | 3 | 2 | 3 | 2 |
| Course 414                     | Applied Pharmacology – II                         | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 2 |
| Course 415                     | Introduction to Cardiac care Technology - II      | 2 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 |
| <b>5<sup>TH</sup> Semester</b> |   |   |   |   |   |   |   |   |   |   |   |
| Course 511                     | Cardiac care Technology – Clinical– I             | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 3 |
| Course 512                     | Cardiac care Technology – Applied - I             | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 2 |



|   |  |   |   |   |   |   |   |   |   |   |   |
|---|--|---|---|---|---|---|---|---|---|---|---|
| Course 513                                      | Cardiac care<br>Technology<br>Advanced - I                   | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 3 |
| <b>6<sup>TH</sup> Semester</b>                  |  |   |   |   |   |   |   |   |   |   |   |
| Course 611                                      | Cardiac care<br>Technology –<br>Clinical – II                | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 3 |
| Course 612                                      | Cardiac care<br>Technology –<br>Applied – II                 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 2 |
| <b>7<sup>TH</sup> Semester<br/>(Internship)</b> |  |   |   |   |   |   |   |   |   |   |   |
| Course 711                                      | Cardiovascular<br>Technology<br>Internship &<br>Project work | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 2 |
| <b>8<sup>TH</sup> Semester<br/>(Internship)</b> |  |   |   |   |   |   |   |   |   |   |   |
| Course 811                                      | Cardiovascular<br>Technology<br>Internship &<br>Project work | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 2 |
| Average:  |  |   |   |   |   |   |   |   |   |   |   |

**1. Slight (Low)      2. Moderate (Medium)      3. Substantial (High)**



**SHARDA UNIVERSITY**  
**School of Allied Health Sciences**  
**Program: B.Sc in Cardiovascular Technology (BCVT)**  
**Term.: 1<sup>ST</sup> Semester**  
**Session: 2021-2022**

| S. No.             | Paper ID | Course Code | Subjects                                   | Teaching Load |   |   | Credits   | Core/Elective Pre-Requisite/ Co Requisite | Type of Course <sup>1</sup> :<br>1. CC<br>2. AECC<br>3. SEC<br>4. DSE |
|--------------------|----------|-------------|--|---------------|---|---|-----------|---|---|
|                    |          |             |  | L             | T | P |           |   |   |
| <b>THEORY</b>      |          |             |  |               |   |   |           |   |   |
| 1.                 |          | BCT111      | Human Anatomy – I                          | 2             | 1 | - | 3         | Core                                      | CC  |
| 2.                 |          | BCT112      | Physiology – I                             | 2             | 1 | - | 3         | Core                                      | CC  |
| 3.                 |          | BCT113      | Biochemistry – I                           | 2             | 1 | - | 3         | Core                                      | CC  |
| 4.                 |          | BCT114      | Pathology – I                              | 2             | 1 | - | 3         | Core                                      | CC  |
| 5.                 |          | BCT115      | Microbiology – I                           | 2             | 1 | - | 3         | Core                                      | CC  |
| 6.                 |          | BCT116      | Basics of Hospital and data management – I | 2             | 0 | - | 2         | Core                                      | CC  |
| <b>Practical</b>   |          |             |  |               |   |   |           |   |   |
| 1.                 |          | BCT121      | Human Anatomy – I                          | -             | - | 2 | 1         | Core                                      | CC, AECC  |
| 2.                 |          | BCT122      | Physiology – I                             | -             | - | 2 | 1         | Core                                      | CC, AECC  |
| 3.                 |          | BCT123      | Biochemistry – I                           | -             | - | 2 | 1         | Core                                      | CC, AECC  |
| 4.                 |          | BCT124      | Pathology – I                              | -             | - | 2 | 1         | Core                                      | CC, AECC  |
| 5.                 |          | BCT125      | Microbiology – I                           | -             | - | 2 | 1         | Core                                      | CC, AECC  |
| 6.                 |          | BCT126      | Basics of Hospital and data management - I | -             | - | - | -         | -   | -   |
| <b>TOTAL HOURS</b> |          |             |  |               |   |   | <b>23</b> |   |   |

<sup>1</sup> CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

**SHARDA UNIVERSITY**  
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**Program: B.Sc in Cardiovascular Technology (BCVT)**  
**Term.: 2<sup>ND</sup> Semester**  
**Session: 2021-2022**

| S. No.             | Paper ID | Course Code | Subjects                                    | Teaching Load |   |   | Credits   | Core/Elective Pre-Requisite/ Co Requisite | Type of Course <sup>2</sup> :<br>5. CC<br>6. AECC<br>7. SEC<br>8. DSE |
|--------------------|----------|-------------|---|---------------|---|---|-----------|---|---|
|                    |          |             |   | L             | T | P |           |   |   |
| <b>THEORY</b>      |          |             |   |               |   |   |           |   |   |
| 7.                 |          | BCT211      | Human Anatomy – II                          | 2             | 1 | - | 3         | Core                                      | CC  |
| 8.                 |          | BCT212      | Physiology – II                             | 2             | 1 | - | 3         | Core                                      | CC  |
| 9.                 |          | BCT213      | Biochemistry – II                           | 2             | 1 | - | 3         | Core                                      | CC  |
| 10.                |          | BCT214      | Pathology – II                              | 2             | 1 | - | 3         | Core                                      | CC  |
| 11.                |          | BCT215      | Microbiology – II                           | 2             | 1 | - | 3         | Core                                      | CC  |
| 12.                |          | BCT216      | Basics of Hospital and data management – II | 2             | 0 | - | 2         | Core                                      | CC  |
| 13.                |          | OPE         | Open Elective course                        | 2             | - | - | 2         | Elective                                  | AECC, SEC   |
| <b>Practical</b>   |          |             |   |               |   |   |           |   |   |
| 7.                 |          | BCT221      | Human Anatomy – II                          | -             | - | 2 | 1         | Core                                      | CC, AECC  |
| 8.                 |          | BCT222      | Physiology – II                             | -             | - | 2 | 1         | Core                                      | CC, AECC  |
| 9.                 |          | BCT223      | Biochemistry – II                           | -             | - | 2 | 1         | Core                                      | CC, AECC  |
| 10.                |          | BCT224      | Pathology – II                              | -             | - | 2 | 1         | Core                                      | CC, AECC  |
| 11.                |          | BCT225      | Microbiology – II                           | -             | - | 2 | 1         | Core                                      | CC, AECC  |
| 12.                |          | BCT226      | Basics of Hospital and data management – II | -             | - | - | -         | -   | -   |
| <b>TOTAL HOURS</b> |          |             |   |               |   |   | <b>23</b> |   |   |

<sup>2</sup> CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

**SHARDA UNIVERSITY**  
**School of Allied Health Sciences**  
**Program: B.Sc in Cardiovascular Technology (BCVT)**

**Term.: 3 Semester**  
**Session: 2022-2023**

| S. No.             | Paper ID | Course Code | Subjects  | Teaching Load |   |   | Credits   | Core/Elective Pre-Requisite/ Co Requisite | Type of Course <sup>3</sup> :<br>9. CC<br>10. AECC<br>11. SEC<br>12. DSE |
|--------------------|----------|-------------|---|---------------|---|---|-----------|---|--|
|                    |          |             |   | L             | T | P |           |   |  |
| <b>THEORY</b>      |          |             |   |               |   |   |           |   |  |
| 1                  |          | BCT311      | Medicine relevant cardiac care to technology –I | 4             | - | - | 4         | Core                                      | CC   |
| 2                  |          | BCT312      | Applied Pathology –I                            | 3             | 1 | - | 4         | Core                                      | CC   |
| 3                  |          | BCT313      | Applied Microbiology – I                        | 2             | 1 | - | 3         |   |  |
| 4                  |          | BCT314      | Applied Pharmacology – I                        | 2             | 1 | - | 3         | Core                                      | CC   |
| 5                  |          | BCT315      | Introduction to Cardiac care Technology– I      | 3             | 1 | - | 4         | Core                                      | CC   |
| <b>Practical</b>   |          |             |   |               |   |   |           |   |  |
| 1                  |          | BCT321      | Medicine relevant cardiac care to technology –I | -             | - | - | -         | -   | -  |
| 2                  |          | BCT322      | Applied Pathology –I                            | -             | - | 2 | 1         | Core                                      | CC, AECC   |
| 3                  |          | BCT323      | Applied Microbiology – I                        | -             | - | 2 | 1         | Core                                      | CC, AECC   |
| 4                  |          | BCT324      | Applied Pharmacology – I                        | -             | - | - | -         | -   | -  |
| 5                  |          | BCT325      | Introduction to Cardiac care Technology– I      | -             | - | 4 | 2         | Core                                      | CC, AECC   |
| <b>TOTAL HOURS</b> |          |             |   |               |   |   | <b>24</b> |   |  |

<sup>3</sup> CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

**SHARDA UNIVERSITY**  
**School of Allied Health Sciences**  
**Program: B.Sc in Cardiovascular Technology (BCVT)**

**Term.: 4 Semester**  
**Session: 2022-2023**

| S. No.             | Paper ID | Course Code | Subjects  | Teaching Load |   |   | Credits   | Core/Elective Pre-Requisite/ Co Requisite | Type of Course <sup>4</sup> :<br>13. CC<br>14. AECC<br>15. SEC<br>16. DSE |
|--------------------|----------|-------------|---|---------------|---|---|-----------|---|---|
|                    |          |             |   | L             | T | P |           |   |   |
| <b>THEORY</b>      |          |             |   |               |   |   |           |   |   |
| 1                  |          | BCT411      | Medicine relevant cardiac care to technology – II | 4             | - | - | 4         | Core                                      | CC  |
| 2                  |          | BCT412      | Applied Pathology – II                            | 3             | 1 | - | 4         | Core                                      | CC  |
|                    |          | BCT413      | Applied Microbiology – II                         | 2             | 1 | - | 3         |   |   |
| 3                  |          | BCT414      | Applied Pharmacology – II                         | 2             | 1 | - | 3         | Core                                      | CC  |
| 4                  |          | BCT415      | Introduction to Cardiac care Technology– II       | 3             | 1 | - | 4         | Core                                      | CC  |
|                    |          | OPE         | Open Elective course                              | 2             | - | - | 2         | Elective                                  | AECC, SEC   |
| <b>Practical</b>   |          |             |   |               |   |   |           |   |   |
| 1                  |          | BCT421      | Medicine relevant cardiac care to technology – II | -             | - | - | -         | -   | -   |
| 2                  |          | BCT422      | Applied Pathology – II                            | -             | - | 2 | 1         | Core                                      | CC, AECC  |
|                    |          | BCT423      | Applied Microbiology – II                         | -             | - | 2 | 1         | Core                                      | CC, AECC  |
| 3                  |          | BCT424      | Applied Pharmacology – II                         | -             | - | - | -         | -   | -   |
| 4                  |          | BCT425      | Introduction to Cardiac care Technology– II       | -             | - | 4 | 2         | Core                                      | CC, AECC  |
| <b>TOTAL HOURS</b> |          |             |   |               |   |   | <b>24</b> |   |   |

<sup>4</sup> CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

**SHARDA UNIVERSITY**  
**School of Allied Health Sciences**  
**Program: B.Sc in Cardiovascular Technology (BCVT)**

**Term.: 5 Semester**

**Session: 2023-2024**

| S. No.             | Paper ID | Course Code | Subjects                               | Teaching Load |   |   | Credits   | Core/Elective Pre-Requisite/ Co Requisite | Type of Course <sup>5</sup> :<br>17. CC<br>18. AECC<br>19. SEC<br>20. DSE |
|--------------------|----------|-------------|--|---------------|---|---|-----------|---|---|
|                    |          |             |  | L             | T | P |           |   |   |
| <b>THEORY</b>      |          |             |  |               |   |   |           |   |   |
| 1                  |          | BCT511      | Cardiac care Technology – Clinical - I | 4             | 2 | - | 6         | Core                                      | CC  |
| 2                  |          | BCT512      | Cardiac care Technology – Applied - I  | 4             | 2 | - | 6         | Core                                      | CC  |
| 3                  |          | BCT513      | Cardiac care Technology – Advanced - I | 4             | 2 | - | 6         | Core                                      | CC  |
| <b>Practical</b>   |          |             |  |               |   |   |           |   |   |
| 1                  |          | BCT521      | Cardiac care Technology – Clinical - I | -             | - | 8 | 4         | Core                                      | CC, AECC  |
| 2                  |          | BCT522      | Cardiac care Technology – Applied - I  | -             | - | 8 | 4         | Core                                      | CC, AECC  |
| 3                  |          | BCT523      | Cardiac care Technology – Advanced - I | -             | - | 8 | 4         | Core                                      | CC, AECC  |
| <b>TOTAL HOURS</b> |          |             |  |               |   |   | <b>32</b> |   |   |

**SHARDA UNIVERSITY**  
**School of Allied Health Sciences**  
**Program: B.Sc in Cardiovascular Technology (BCVT)**

**Term.: 6 Semester**

**Session: 2023-24**

| S. No.             | Paper ID | Course Code | Subjects                                | Teaching Load |   |   | Credits   | Core/Elective Pre-Requisite/ Co Requisite | Type of Course <sup>6</sup> :<br>21. CC<br>22. AECC<br>23. SEC<br>24. DSE |
|--------------------|----------|-------------|---|---------------|---|---|-----------|---|---|
|                    |          |             |   | L             | T | P |           |   |   |
| <b>THEORY</b>      |          |             |   |               |   |   |           |   |   |
| 1                  |          | BCT611      | Cardiac care Technology – Clinical - II | 4             | 2 | - | 6         | Core                                      | CC  |
| 2                  |          | BCT612      | Cardiac care Technology – Applied – II  | 4             | 2 | - | 6         | Core                                      | CC  |
| 3                  |          | BCT613      | Cardiac care Technology – Advanced - II | 4             | 2 | - | 6         | Core                                      | CC  |
|                    |          | OPE         | Open Elective course                    | 2             | - | - | 2         | Elective                                  | AECC, SEC   |
| <b>Practical</b>   |          |             |   |               |   |   |           |   |   |
| 1                  |          | BCT621      | Cardiac care Technology – Clinical - II | -             | - | 8 | 4         | Core                                      | CC, AECC  |
| 2                  |          | BCT622      | Cardiac care Technology – Applied – II  | -             | - | 8 | 4         | Core                                      | CC, AECC  |
| 3                  |          | BCT623      | Cardiac care Technology – Advanced - II | -             | - | 8 | 4         | Core                                      | CC, AECC  |
| <b>TOTAL HOURS</b> |          |             |   |               |   |   | <b>32</b> |   |   |



**SHARDA UNIVERSITY**  
**School of Allied Health Sciences**  
**Program: B.Sc in Cardiovascular Technology (BCVT)**  
**Term.: 7 Semester**  
**Session: 2024-2025**

| S. No.        | Paper ID | Course Code | Subjects   | Teaching Load |   |    | Credits | Core/Elective Pre-Requisite/ Co Requisite | Type of Course <sup>7</sup> :<br>25. CC<br>26. AECC<br>27. SEC<br>28. DSE |
|---------------|----------|-------------|--|---------------|---|----|---------|---|---|
|               |          |             |  | L             | T | P  |         |   |   |
| <b>THEORY</b> |          |             |  |               |   |    |         |   |   |
| 1             |          | BCT721      | Cardiovascular Technology Internship & Project work– I | -             | - | 40 | 20      | Core                                      | CC  |

**SHARDA UNIVERSITY**  
**School of Allied Health Sciences**  
**Program: B.Sc in Cardiovascular Technology (BCVT)**  
**Term.: 8 Semester**  
**Session: 2024-2025**

| S. No.        | Paper ID | Course Code | Subjects   | Teaching Load |   |    | Credits | Core/Elective Pre-Requisite/ Co Requisite | Type of Course <sup>8</sup> :<br>29. CC<br>30. AECC<br>31. SEC<br>32. DSE |
|---------------|----------|-------------|--|---------------|---|----|---------|---|---|
|               |          |             |  | L             | T | P  |         |   |   |
| <b>THEORY</b> |          |             |  |               |   |    |         |   |   |
| 1             |          | BCT821      | Cardiovascular Technology Internship & Project work - II | -             | - | 40 | 20      | Core                                      | CC  |

**Note :**

- 1) Value added course is mandatory for each student of every year (List of VAC are enclosed in Annexure 1) and it is a non-graded course.
- 2) Open elective course is mandatory for each student of every year (List of approved open elective course offered by the University are enclosed as Annexure 2) and it will be audit mode.
- 3) In each academic session, project work/Clinical Posting/Community connect program will be provided to the students.
- 4) B.sc in cardiovascular technology 4 year (Clinical training & internship is non graded)

**Clinical training and internship:** every student who has passed in all the theory and practical examination of all the years will have to undergo one year compulsory internship in at least 100 bedded hospital.

**Table1:Evaluation scheme of BSc. CARDIOVASCULAR TECHNOLOGY (BCVT)1<sup>st</sup> semester University examination:**

**(FOR 2021 - 2022)**

| S.No                         | Paper ID | Course Code | Subject Name                               | EVALUATION SCHEME<br>(Distribution of Marks) |                      |                      | Total Marks |
|------------------------------|----------|-------------|--|--|----------------------|----------------------|-------------|
|                              |          |             |  | Continuous Assessment                        | Mid Term Examination | End Term Examination |             |
| <b>THEORY SUBJECTS</b>       |          |             |  |  |                      |                      |             |
| 1                            |          | BCT111      | HUMAN ANATOMY – I                          | 30   | 20                   | 50                   | 100         |
| 2                            |          | BCT112      | PHYSIOLOGY – I                             | 30   | 20                   | 50                   | 100         |
| 3                            |          | BCT113      | BIOCHEMISTRY – I                           | 30   | 20                   | 50                   | 100         |
| 4                            |          | BCT114      | PATHOLOGY – I                              | 30   | 20                   | 50                   | 100         |
| 5                            |          | BCT115      | MICROBIOLOGY – I                           | 30   | 20                   | 50                   | 100         |
| 6                            |          | BCT116      | BASICS OF HOSPITAL AND DATA MANAGEMENT - I | 30   | 20                   | 50                   | 100         |
| <b>PRACTICAL SUBJECTS</b>    |          |             |  |  |                      |                      |             |
| 1                            |          | BCT121      | HUMAN ANATOMY – I                          | 60   | -                    | 40                   | 100         |
| 2                            |          | BCT122      | PHYSIOLOGY – I                             | 60   | -                    | 40                   | 100         |
| 3                            |          | BCT123      | BIOCHEMISTRY – I                           | 60   | -                    | 40                   | 100         |
| 4                            |          | BCT124      | PATHOLOGY – I                              | 60   | -                    | 40                   | 100         |
| 5                            |          | BCT125      | MICROBIOLOGY – I                           | 60   | -                    | 40                   | 100         |
| 6                            |          | BCT126      | BASICS OF HOSPITAL AND DATA MANAGEMENT - I | -  | -                    | -                    | -           |
| Grand Total [6 (Th) +5(Pr) ] |          |             |  |  |                      |                      | 1100        |

**Note:** Open elective course will be in audit mode and student will have to pass it.

SU/SAHS/BCVT

**Table 2: Evaluation scheme of BSC. CARDIOVASCULAR TECHNOLOGY (BCVT) 2<sup>ND</sup> semester University examination:  
(FOR 2021 - 2022)**

| S.No                      | Paper ID | Course Code | Subject Name                                | EVALUATION SCHEME<br>(Distribution of Marks) |                      |                              | Total Marks |
|---------------------------|----------|-------------|---|--|----------------------|------------------------------|-------------|
|                           |          |             |   | Continuous Assessment                        | Mid Term Examination | End Term Examination         |             |
| <b>THEORY SUBJECTS</b>    |          |             |   |  |                      |                              |             |
| 1                         |          | BCT211      | HUMAN ANATOMY – II                          | 30   | 20                   | 50                           | 100         |
| 2                         |          | BCT212      | PHYSIOLOGY – II                             | 30   | 20                   | 50                           | 100         |
| 3                         |          | BCT213      | BIOCHEMISTRY – II                           | 30   | 20                   | 50                           | 100         |
| 4                         |          | BCT214      | PATHOLOGY – II                              | 30   | 20                   | 50                           | 100         |
| 5                         |          | BCT215      | MICROBIOLOGY – II                           | 30   | 20                   | 50                           | 100         |
| 6                         |          | BCT216      | BASICS OF HOSPITAL AND DATA MANAGEMENT – II | 30   | 20                   | 50                           | 100         |
| <b>PRACTICAL SUBJECTS</b> |          |             |   |  |                      |                              |             |
| 1                         |          | BCT221      | HUMAN ANATOMY – II                          | 60   | -                    | 40                           | 100         |
| 2                         |          | BCT222      | PHYSIOLOGY – II                             | 60   | -                    | 40                           | 100         |
| 3                         |          | BCT223      | BIOCHEMISTRY – II                           | 60   | -                    | 40                           | 100         |
| 4                         |          | BCT224      | PATHOLOGY – II                              | 60   | -                    | 40                           | 100         |
| 5                         |          | BCT225      | MICROBIOLOGY – II                           | 60   | -                    | 40                           | 100         |
| 6                         |          | BCT226      | BASICS OF HOSPITAL AND DATA MANAGEMENT – II | -  | -                    | -                            | -           |
|                           |          |             |   |  |                      | Grand Total [6 (Th) +5(Pr) ] | 1100        |

**Note:** Open elective course will be in audit mode and student will have to pass it.

SU/SAHS/BCVT

**Table 3: Evaluation scheme of BSc. CARDIOVASCULAR TECHNOLOGY (BCVT)3<sup>RD</sup> semester University examination:**

**(FOR 2021 - 2022)**

| S.No                         | Paper ID | Course Code | Subject Name                                    | EVALUATION SCHEME<br>(Distribution of Marks) |                      |                      | Total Marks |
|------------------------------|----------|-------------|---|--|----------------------|----------------------|-------------|
|                              |          |             |   | Continuous Assessment                        | Mid Term Examination | End Term Examination |             |
| <b>THEORY SUBJECTS</b>       |          |             |   |  |                      |                      |             |
| 1                            |          | BCT311      | Medicine relevant cardiac care totechnology – I | 30   | 20                   | 50                   | 100         |
| 2                            |          | BCT312      | Applied Pathology – I                           | 30   | 20                   | 50                   | 100         |
| 3                            |          | BCT313      | Applied Microbiology- I                         | 30   | 20                   | 50                   | 100         |
| 4                            |          | BCT314      | Applied Pharmacology – I                        | 30   | 20                   | 50                   | 100         |
| 5                            |          | BCT315      | Introduction to Cardiac care Technology – I     | 30   | 20                   | 50                   | 100         |
| <b>PRACTICAL SUBJECTS</b>    |          |             |   |  |                      |                      |             |
| 1                            |          | BCT321      | Medicine relevant cardiac care totechnology – I | -  | -                    | -                    | -           |
| 2                            |          | BCT322      | Applied Pathology – I                           | 60   | -                    | 40                   | 100         |
| 3                            |          | BCT323      | Applied Microbiology – I                        | 60   | -                    | 40                   | 100         |
| 4                            |          | BCT324      | Applied Pharmacology – I                        | -  | -                    | -                    | -           |
| 5                            |          | BCT325      | Introduction to Cardiac care Technology - I     | 60   | -                    | 40                   | 100         |
| Grand Total [5 (Th) +3(Pr) ] |          |             |   |  |                      |                      | 800         |

**Note:** Open elective course will be in audit mode and student will have to pass it.

**Table 4: Evaluation scheme of BSc. CARDIOVASCULAR TECHNOLOGY (BCVT)4<sup>TH</sup> semester University examination:**

**(FOR 2021 - 2022)**

| S.No                         | Paper ID | Course Code | Subject Name                                      | EVALUATION SCHEME<br>(Distribution of Marks) |                      |                      | Total Marks |
|------------------------------|----------|-------------|---|--|----------------------|----------------------|-------------|
|                              |          |             |   | Continuous Assessment                        | Mid Term Examination | End Term Examination |             |
| <b>THEORY SUBJECTS</b>       |          |             |   |  |                      |                      |             |
| 1                            |          | BCT411      | Medicine relevant cardiac care to technology – II | 30   | 20                   | 50                   | 100         |
| 2                            |          | BCT412      | Applied Pathology – II                            | 30   | 20                   | 50                   | 100         |
| 3                            |          | BCT413      | Applied Microbiology- II                          | 30   | 20                   | 50                   | 100         |
| 4                            |          | BCT414      | Applied Pharmacology – II                         | 30   | 20                   | 50                   | 100         |
| 5                            |          | BCT415      | Introduction to Cardiac care Technology – II      | 30   | 20                   | 50                   | 100         |
| <b>PRACTICAL SUBJECTS</b>    |          |             |   |  |                      |                      |             |
| 1                            |          | BCT421      | Medicine relevant cardiac care to technology – II | -  | -                    | -                    | -           |
| 2                            |          | BCT422      | Applied Pathology – II                            | 60   | -                    | 40                   | 100         |
| 3                            |          | BCT423      | Applied Microbiology – II                         | 60   | -                    | 40                   | 100         |
| 4                            |          | BCT424      | Applied Pharmacology – II                         | -  | -                    | -                    | -           |
| 5                            |          | BCT425      | Introduction to Cardiac care Technology - II      | 60   | -                    | 40                   | 100         |
| Grand Total [5 (Th) +3(Pr) ] |          |             |   |  |                      |                      | 800         |

**Note:** Open elective course will be in audit mode and student will have to pass it.

**Table 5: Evaluation scheme of BSc. CARDIOVASCULAR TECHNOLOGY (BCVT) 5<sup>TH</sup> semester University examination:**

**(FOR 2021 - 2022)**

| S.No                         | Paper ID | Course Code | Subject Name                          | EVALUATION SCHEME<br>(Distribution of Marks) |                      |                      | Total Marks |
|------------------------------|----------|-------------|---------------------------------------|--|----------------------|----------------------|-------------|
|                              |          |             |                                       | Continuous Assessment                        | Mid Term Examination | End Term Examination |             |
| <b>THEORY SUBJECTS</b>       |          |             |                                       |  |                      |                      |             |
| 1                            |          | BCT511      | Cardiac care Technology – Clinical- I | 30   | 20                   | 50                   | 100         |
| 2                            |          | BCT512      | Cardiac care Technology – Applied- I  | 30   | 20                   | 50                   | 100         |
| 3                            |          | BCT513      | Cardiac care Technology – Advanced- I | 30   | 20                   | 50                   | 100         |
| <b>PRACTICAL SUBJECTS</b>    |          |             |                                       |  |                      |                      |             |
| 1                            |          | BCT521      | Cardiac care Technology – Clinical- I | 60   | -                    | 40                   | 100         |
| 2                            |          | BCT522      | Cardiac care Technology – Applied- I  | 60   | -                    | 40                   | 100         |
| 3                            |          | BCT523      | Cardiac care Technology – Advanced- I | 60   | -                    | 40                   | 100         |
| Grand Total [3 (Th) +3(Pr) ] |          |             |                                       |  |                      |                      | 800         |

**Note:** Open elective course will be in audit mode and student will have to pass it.

**Table 6: Evaluation scheme of BSC. CARDIOVASCULAR TECHNOLOGY (BCVT) 6<sup>TH</sup> semester University examination:**

**(FOR 2021 - 2022)**

| S.No                         | Paper ID | Course Code | Subject Name                            | EVALUATION SCHEME<br>(Distribution of Marks) |                      |                      | Total Marks |
|------------------------------|----------|-------------|---|--|----------------------|----------------------|-------------|
|                              |          |             |   | Continuous Assessment                        | Mid Term Examination | End Term Examination |             |
| <b>THEORY SUBJECTS</b>       |          |             |   |  |                      |                      |             |
| 1                            |          | BCT611      | Cardiac care Technology – Clinical – II | 30   | 20                   | 50                   | 100         |
| 2                            |          | BCT612      | Cardiac care Technology – Applied – II  | 30   | 20                   | 50                   | 100         |
| 3                            |          | BCT613      | Cardiac care Technology – Advanced- II  | 30   | 20                   | 50                   | 100         |
| <b>PRACTICAL SUBJECTS</b>    |          |             |   |  |                      |                      |             |
| 1                            |          | BCT621      | Cardiac care Technology – Clinical – II | 60   | -                    | 40                   | 100         |
| 2                            |          | BCT622      | Cardiac care Technology – Applied – II  | 60   | -                    | 40                   | 100         |
| 3                            |          | BCT623      | Cardiac care Technology – Advanced- II  | 60   | -                    | 40                   | 100         |
| Grand Total [3 (Th) +3(Pr) ] |          |             |   |  |                      |                      | 800         |

**Note:** Open elective course will be in audit mode and student will have to pass it.



**Table 7: Evaluation scheme of BSc. CARDIOVASCULAR TECHNOLOGY (BCVT) 7<sup>TH</sup> SEMESTER University examination (Internship):**

**(FOR 2021 - 2022)**

| S.No | Paper ID | Course Code | Subject Name  | EVALUATION SCHEME<br>(Distribution of Marks) |                      |                      | Total Marks |
|------|----------|-------------|---|--|----------------------|----------------------|-------------|
|      |          |             |   | Continuous Assessment                        | Mid Term Examination | End Term Examination |             |
| 1    |          | BCT721      | Cardiovascular Technology Internship & Project work | -  | -                    | 100                  | 100         |
|      |          |             |   |  |                      |                      |             |

**Note:** Open elective course will be in audit mode and student will have to pass it.

**Table 8: Evaluation scheme of BSc. CARDIOVASCULAR TECHNOLOGY (BCVT) 8<sup>TH</sup> SEMESTER University examination (Internship):**

**(FOR 2021 - 2022)**

| S.No | Paper ID | Course Code | Subject Name  | EVALUATION SCHEME<br>(Distribution of Marks) |                      |                      | Total Marks |
|------|----------|-------------|---|--|----------------------|----------------------|-------------|
|      |          |             |   | Continuous Assessment                        | Mid Term Examination | End Term Examination |             |
| 1    |          | BCT821      | Cardiovascular Technology Internship & Project work | -  | -                    | 100                  | 100         |

**Note:** Open elective course will be in audit mode and student will have to pass it.



**Course Structure  
Of  
BSc. CARDIOVASCULAR TECHNOLOGY  
(BCVT)**

**BCT111 – HUMAN ANATOMY-I & BCT121 – HUMAN ANATOMY-I (Lab)**

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|  |                          |  |  |
|--|--------------------------|--|--|
| <b>School: SAHS</b>                              |                          | <b>Batch : 2021-25</b>   |  |
| <b>Program: BCVT</b>                             |                          | <b>Current Academic Year: 2021-22</b>  |  |
| <b>Branch:<br/>Cardiovascular<br/>Technology</b> |                          | <b>Semester: 1</b>   |  |
| 1  | Course Code              | <b>BCT 111</b>   |  |
| 2  | Course Title             | <b>HUMAN ANATOMY-I</b>   |  |
| 3  | Credits                  | <b>3</b>   |  |
| 4  | Contact Hours<br>(L-T-P) | <b>2-1-0</b>   |  |
|  | Course Status            | Compulsory   |  |
| 5  | Course Objective         | <p>1) To provide an opportunity for lab technologists who distinguish themselves in Human Anatomy - dissection consistency, theoretical knowledge and knowledge application, to undertake research based training in Anatomy.</p> <p>2) To capture distinguished medical students and offer them such training as would enable them to sub-specialize in anatomy at an early stage of their career.</p> <p>3) To develop as research scientists and research based teachers for schools of allied health sciences both locally and externally.</p> <p>4) It also strengthens the research foundation of the students with broad vision of leading in research based teaching of anatomy and stimulates the</p> |  |

|   |                    |   |  |
|---|--------------------|---|--|
|   |                    | research attitudes and aptitudes of students.   |  |
| 6 | Course Outcomes    | <p>CO1: To understand the importance of Anatomy of human body</p> <p>CO2: To understand the importance of different types of bones involved in locomotion</p> <p>CO3: To understand the importance of Cardiovascular system</p> <p>CO4: To understand the importance of Gastro-intestinal system</p> <p>CO5: To understand the importance of Respiratory system</p> |  |
| 7 | Course Description | <ul style="list-style-type: none"> <li>• Cells and its organelles</li> <li>• Locomotion and support</li> <li>• Cardiovascular system</li> <li>• Gastro-intestinal system</li> </ul>   |  |

|   |                                   |   |            |
|---|-----------------------------------|---|------------|
|   |                                   | <ul style="list-style-type: none"> <li>Respiratory system</li> </ul>  |            |
| 8 | Outline syllabus<br><b>Theory</b> |   | CO mapping |
|   | <b>Unit 1</b>                     | Introduction of Anatomy   |            |
|   |                                   | <ol style="list-style-type: none"> <li>Introduction to Anatomy (division, planes, terminology for direction &amp; movements)</li> <li>Cell and its organelles</li> <li>Tissue: Connective &amp; Epithelium- definition, classification, example and function</li> <li>Glands- classification, describe serous and mucus glands with example.</li> <li>Basic tissue classification with examples.</li> </ol> | CO1, CO2   |
|   | <b>Unit 2</b>                     | Locomotion and support  | CO1, CO2   |
|   |                                   | <ol style="list-style-type: none"> <li>Cartilage – types and histology</li> <li>Bones – classification, development, histology.</li> <li>Joints – classification with examples.</li> <li>Muscles – classification and histology (name of muscles of the body)</li> <li>Details of synovial joint</li> </ol>   |            |
|   | <b>Unit 3</b>                     | Cardiovascular system   | CO1, CO3   |
|   |                                   | <ol style="list-style-type: none"> <li>Heart- size, location, chambers, exterior and interior.</li> <li>Blood supply of heart (Branches of aorta and all major artery, Major veins of body)</li> <li>Systemic and pulmonary circulation</li> <li>Lymphatic system (Histology of lymphatic organs)</li> </ol>  |            |
|   | <b>Unit 4</b>                     | Gastro intestinal system  | CO1, CO4   |
|   |                                   | <ol style="list-style-type: none"> <li>Parts of GIT, oral cavity (lips, tongue, salivary gland with histology), tonsil, dentition, pharynx, salivary gland, waldeyer's ring.</li> <li>Oesophagus. Stomach. Intestine.</li> <li>Radiographs of abdomen.</li> <li>Accessory digestive organs (liver, pancreas, gallbladder)</li> </ol>  |            |
|   | <b>Unit 5</b>                     | Respiratory system  | CO1, CO5   |

|   |                              |  |            |
|---|------------------------------|--|------------|
|   |                              | <ol style="list-style-type: none"> <li>1. Part of respiratory system</li> <li>2. Nose, nasal cavity, larynx, trachea</li> <li>3. Lungs and Broncho pulmonary segment</li> <li>4. Histology of lungs</li> <li>5. Names of paranasal sinuses.</li> </ol>   |            |
|   |                              |  |            |
| 1 | <b>Course Code</b>           | <b>BCT121</b>  |            |
| 2 | <b>Course Title</b>          | <b>HUMAN ANATOMY –I (LAB)</b>  |            |
| 3 | <b>Credits</b>               | <b>1</b>   |            |
| 4 | <b>Contact Hours (L-T-P)</b> | <b>0-0-2</b>   |            |
| 5 | Course Outcomes              | <p>CO1: To know about Anatomy and its importance</p> <p>CO2: To know the importance of epithelium, cartilage and bones</p> <p>CO3: To know the importance of skeletal (TS &amp; LS), smooth and cardiac muscle</p> <p>CO4: To know the importance of artery, vein, lymph node, spleen, tonsil and thymus</p> <p>CO5: To know the importance of respiratory system</p>  |            |
| 6 | Course Description           | <ul style="list-style-type: none"> <li>• Histology of types of epithelium, serous, mucus and mixed salivary gland</li> <li>• Histology of cartilages, bones</li> <li>• Histology of skeletal (TS &amp; LS), smooth and cardiac muscle</li> <li>• Histology of artery, vein, lymph node, spleen, tonsil and thymus</li> <li>• Demonstration of parts of respiratory system and histology of lung and trachea</li> </ul> |            |
|   | <b>Practical's</b>           |  | CO mapping |
|   | <b>Unit 1</b>                | <ol style="list-style-type: none"> <li>a. Histology of epithelium and salivary gland,</li> <li>b. Histology of cartilage, compact and cancellous bone.</li> <li>c. Histology of muscle tissue.</li> </ol>  | CO1, CO2   |
|   | <b>Unit 2</b>                | <ol style="list-style-type: none"> <li>a. Demonstration of all bone.</li> <li>b. Radiograph of bones &amp; joints.</li> </ol>  | CO1, CO2   |



|  |  |  |     |     |          |
|--|--|--|-----|-----|----------|
|  |  | c. Demonstration of all body muscles.  |     |     |          |
|  | <b>Unit 3</b>                          | a. Histology of vessels.<br>b. Histology of lymph node,<br>c. Histology of spleen.   |     |     | CO1, CO3 |
|  | <b>Unit 4</b>                          | a. Histology of tonsil and thymus<br>b. Demonstration of heart and related structure<br>c. Radiograph related to heart   |     |     | CO1, CO4 |
|  | <b>Unit 5</b>                          | a. Demonstration of lung<br>b. Demonstration of lung related structure.<br>c. Radiograph related to lungs.   |     |     | CO1, CO5 |
|  | Mode of examination                    | Theory and Practical   |     |     |          |
|  | Weightage Distribution for Theory      | CA   | MTE | ETE |          |
|  |  | 30%  | 20% | 50% |          |
|  | Weightage Distribution for Practical's | CA   | MTE | ETE |          |
|  |  | 60%  | 0%  | 40% |          |
|  | Text book/s*                           | 1) Understanding Human Anatomy and Physiology by William Davis<br>2) A text book of Anatomy by BD Chaurasia<br>3) A text book of human Anatomy by T.S. Ranganathan |     |     |          |

|     |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 3 |

|     |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 3 |

**BCT112 – HUMAN PHYSIOLOGY-I& BCT121 – HUMAN PHYSIOLOGY-I (Lab)**

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|  |                       |  |  |
|--|-----------------------|--|--|
| <b>School: SAHS</b>                      |                       | <b>Batch : 2021-25</b>   |  |
| <b>Program: BCVT</b>                     |                       | <b>Current Academic Year: 2021-22</b>  |  |
| <b>Branch: Cardiovascular Technology</b> |                       | <b>Semester: 1</b>   |  |
| 1  | Course Code           | <b>BCT 112</b>   |  |
| 2  | Course Title          | <b>Human Physiology-I</b>  |  |
| 3  | Credits               | <b>3</b>   |  |
| 4  | Contact Hours (L-T-P) | <b>2-1-0</b>   |  |
|  | Course Status         | Compulsory   |  |
| 5  | Course Objective      | <ul style="list-style-type: none"><li>• To learn and understand the fundamental scientific concepts relating to a broad range of topics in human physiology.</li><li>• To make the students familiar with the basic factual information concerning the mechanisms and functioning of humans body system.</li><li>• To develop investigative skills and to become familiar with standard techniques of measurement.</li><li>• To help the students to gain practice and confidence in applying this knowledge, in a quantitative manner where appropriate, to actual experiments.</li></ul> |  |
| 6  | Course Outcomes       | CO1: To know the importance of general and nerve   |  |

|   |                    |   |            |
|---|--------------------|---|------------|
|   |                    | <p>muscle physiology</p> <p>CO2: To understand the importance, function and function of Blood along with clinical importance</p> <p>CO3: To get the information about Cardiovascular system</p> <p>CO4: To understand the respiratory system and its function</p> <p>CO5: To know about Digestive system of the body</p>  |            |
| 7 | Course Description | <ul style="list-style-type: none"> <li>• General &amp; nerve muscle physiology</li> <li>• Blood</li> <li>• Cardiovascular system</li> <li>• The respiratory system</li> <li>• Digestive system</li> </ul>   |            |
| 8 | Outline syllabus   |   | CO mapping |
|   | <b>Theory</b>      |   |            |
|   | <b>Unit 1</b>      |   |            |
|   |                    | <p>1. Cell and cell organelle Structure &amp; function, transport across cell membrane, homeostasis, membrane potential.</p> <p>2. Structure &amp; functions of nerve tissues, physiological properties of nerve fibres, nerve fibre types &amp; functions.</p> <p>3. Neuromuscular junction, Difference between skeletal muscle, smooth muscle &amp; cardiac muscle.</p> | CO1, CO2   |
|   | <b>Unit 2</b>      |   |            |
|   |                    | 1. Composition & functions of blood, plasma   | CO1, CO2   |

|  |               |  |          |
|--|---------------|--|----------|
|  |               | <p>proteins &amp; haemoglobin.</p> <p>2. Erythrocytes, jaundice, leucocytes &amp; platelets.</p> <p>3. Blood coagulation, blood groups &amp; immunity</p>  |          |
|  | <b>Unit 3</b> |  |          |
|  |               | <p>1. Cardiac Muscle, physiological anatomy of the heart &amp; blood vessels, cardiac cycle.</p> <p>2. Conducting system of heart, Heart sounds &amp; ECG.</p> <p>3. Heart Rate, Cardiac Output, Blood Pressure &amp; Pulse.</p> | CO1, CO3 |
|  | <b>Unit 4</b> |  |          |
|  |               | <p>1. Physiological anatomy &amp; functions of respiratory system, airways, dead space, graph of lung volume &amp; capacities.</p> <p>2. Transport of Gases.</p> <p>3. Regulation of respiration &amp; Hypoxia.</p>              | CO1, CO4 |
|  | <b>Unit 5</b> |  |          |
|  |               | <p>1. Physiological anatomy of GIT, Saliva, Mouth &amp; Oesophagus.</p> <p>2. Stomach, Pancreas, Liver &amp; Gall Bladder.</p> <p>3. Small Intestine, Large Intestine, Digestion and Absorption in GIT.</p>                      | CO1, CO5 |
|  |               |  |          |

|   |                              |   |            |
|---|------------------------------|---|------------|
|   |                              |   |            |
| 1 | <b>Course Code</b>           | <b>BCT122</b>   |            |
| 2 | <b>Course Title</b>          | <b>HUMAN PHYSIOLOGY –I(LAB)</b>   |            |
| 3 | <b>Credits</b>               | <b>1</b>  |            |
| 4 | <b>Contact Hours (L-T-P)</b> | <b>0-0-2</b>  |            |
| 5 | Course Outcomes              | <p>CO1: To know about Physiology and its importance</p> <p>CO2: To know the importance of Compound microscope</p> <p>CO3: To know the importance of haemoglobin estimation and blood group detection</p> <p>CO4: To know the importance of Total Red Blood Cell Count and total Leucocyte Count</p> <p>CO5: To know the importance of ESR and PCV</p> |            |
| 6 | Course Description           | <ul style="list-style-type: none"> <li>• Study of Compound Microscope</li> <li>• Estimation of Haemoglobin Concentration</li> <li>• Total Red Blood Cell Count.</li> <li>• Total Leucocyte Count.</li> <li>• BT,CT,Blood Group Estimation and Demonstration of ESR &amp; PCV.</li> </ul>  |            |
|   | <b>Practical's</b>           |   | CO mapping |
|   | <b>Unit 1</b>                | Study of Compound Microscope  | CO1, CO2   |
|   |                              | <p>a. Briefing</p> <p>b. Demonstration</p> <p>c. Practical</p>  |            |
|   | <b>Unit 2</b>                | <b>Estimation of Haemoglobin Concentration</b>  | CO1, CO2   |
|   |                              | <p>a. Briefing</p> <p>b. Demonstration</p>  |            |

|  |  |   |     |     |          |
|--|--|---|-----|-----|----------|
|  |  | c. Practical  |     |     |          |
|  | <b>Unit 3</b>                          | Total Red Blood Cell Count and  |     |     | CO1, CO3 |
|  |  | a. Briefing<br>b. Demonstration<br>c. Practical   |     |     |          |
|  | <b>Unit 4</b>                          | Total Leucocyte Count   |     |     | CO1, CO4 |
|  |  | a. Briefing<br>b. Demonstration<br>c. Practical   |     |     |          |
|  | <b>Unit 5</b>                          | <b>Bleeding Time, Clotting Time, Blood Group Estimation and Demonstration of ESR &amp; PCV.</b>   |     |     | CO1, CO5 |
|  |  | a. BT & CT<br>b. Blood Groups<br>c. Demonstration of ESR & PCV  |     |     |          |
|  | Mode of examination                    | Theory and Practical's  |     |     |          |
|  | Weightage Distribution for Theory      | CA  | MTE | ETE |          |
|  |  | 30%   | 20% | 50% |          |
|  | Weightage Distribution for Practical's | CA  | MTE | ETE |          |
|  |  | 60%   | 0%  | 40% |          |
|  | Text book/s*                           | 1) Text book of Physiology by Guyton<br>2) Human Physiology by Chatterjee<br>3) Concise Medical Physiology by sujith K Choudhary<br>4) Review of Medical Physiology by Ganong<br>5) A text book of Physiology by A.K.Jain |     |     |          |

|     |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 3 |

|     |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 |
|-----|---|---|---|---|---|---|

|     |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|
| CO2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 3 |

### **BCT113: BIOCHEMISTRY- I & BCT 123: BIOCHEMISTRY- I (Lab)**

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|                                       |                       |   |  |
|---------------------------------------|-----------------------|---|--|
| <b>School: SAHS</b>                   |                       | <b>Batch :2021-25</b>   |  |
| <b>Program: BMLT</b>                  |                       | <b>Current Academic Year: 2021-22</b>   |  |
| <b>Branch: Medical Lab Technology</b> |                       | <b>Semester: 1</b>  |  |
| 1                                     | Course Code           | <b>BCT 113</b>  |  |
| 2                                     | Course Title          | <b>BIOCHEMISTRY -I</b>  |  |
| 3                                     | Credits               | <b>3</b>  |  |
| 4                                     | Contact Hours (L-T-P) | <b>2-1-0</b>  |  |
|                                       | Course Status         | Compulsory  |  |
| 5                                     | Course Objective      | <ul style="list-style-type: none"> <li>• To train the students in the management of medical laboratory along with handling a variety of laboratory chemicals and instruments including electronic and advanced equipment's used in modern medical laboratories.</li> <li>• To make the students able to do routine laboratory testing under stipulated conditions.</li> <li>• To prepare specimens and operate machines that automatically analyse samples.</li> <li>• To provide the conceptual basis for understanding biochemical and particularly address the fundamental mechanisms of the biomolecules to facilitate the life.</li> <li>• To develop diagnostic skills in clinical</li> </ul> |  |

|   |                    |  |            |
|---|--------------------|--|------------|
|   |                    | biochemistry and to provide an advanced understanding of the core principles and topics of Biochemistry and their experimental basis.  |            |
| 6 | Course Outcomes    | CO1: To understand the importance of different types of glassware's and laboratory equipment's<br>CO2: To understand the importance of safety measurements and sampling techniques<br>CO3: To understand the importance of acid, base, indicators and nutrition<br>CO4: To understand the importance of chemistry of carbohydrates<br>CO5: To understand the importance of chemistry of lipids |            |
| 7 | Course Description | <ul style="list-style-type: none"> <li>• Introduction of Glassware's</li> <li>• Introduction of Laboratory Equipment's</li> <li>• Safety of measurements in Laboratory, Sampling technique and its preservation</li> <li>• Preparation of Solutions</li> <li>• Acid, Base and Indicators</li> <li>• Nutrition</li> <li>• Carbohydrate Chemistry</li> <li>• Lipid Chemistry</li> </ul>          |            |
| 8 | Outline syllabus   |  | CO mapping |
|   | <b>Unit 1</b>      | <b>Introduction of Glassware's and laboratory equipment's</b>  | CO1        |
|   |                    | a. Pipettes, Burettes, Beakers, Petri dishes, depression plates; Flasks - different types; Volumetric, round bottomed, Erlenmeyerconical etc.<br>b. Water bath: Use, care and maintenance. Oven & Incubators.<br>c. Refrigerators, cold box, deep freezers. Colorimeter and spectrophotometer.   |            |
|   | <b>Unit 2</b>      | <b>Safety of measurements in Laboratory, Sampling technique and its preservation</b>   | CO2        |
|   |                    | a. Different types of samples such as urine, blood, stool, tissue etc and various techniques to preserve the samples.<br>b. Preparation of percentage and normal solution.<br>c. Preparation of molar and molal solution.  |            |



|  |               |  |     |
|--|---------------|--|-----|
|  | <b>Unit 3</b> | <b>Acid, Base, Indicators and Nutrition</b>  | CO3 |
|  |               | <ul style="list-style-type: none"> <li>a. Acid- base indicators: Definition, concept, mechanism of action.</li> <li>b. Importance of nutrition: Calorific values, Respiratory quotient, Energy requirement of a person - Basal metabolic rate.</li> <li>c. Balanced diet, recommended dietary allowances, Role of carbohydrates, lipid and protein in diet.</li> </ul> |     |
|  | <b>Unit 4</b> | <b>Carbohydrate Chemistry</b>  | CO4 |
|  |               | <ul style="list-style-type: none"> <li>1. Definition, general classification with examples.</li> <li>2. Glycosidic bond, Structures, composition, sources, properties and functions of Monosaccharide's and Disaccharides.</li> <li>3. Structures, composition, sources, properties and functions of Oligosaccharides and Polysaccharides.</li> </ul>                  |     |
|  | <b>Unit 5</b> | <b>Lipid Chemistry</b>   | CO5 |
|  |               | <ul style="list-style-type: none"> <li>a. Definition, classification, properties and functions of Fatty acids.</li> <li>b. Triacylglycerol and Phospholipids.</li> <li>c. Cholesterol, Essential fatty acids and their importance, Lipoprotein.</li> </ul>   |     |

|     | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 3   | 3   | 3   | 3   | 3   | 3   |
| CO2 | 3   | 2   | 2   | 3   | 3   | 3   |
| CO3 | 3   | 3   | 3   | 3   | 3   | 3   |
| CO4 | 3   | 3   | 3   | 3   | 3   | 3   |
| CO5 | 3   | 3   | 3   | 3   | 2   | 3   |

|   |                     |                             |  |
|---|---------------------|-----------------------------|--|
| 1 | <b>Course Code</b>  | <b>BCT 123</b>              |  |
| 2 | <b>Course Title</b> | <b>BIOCHEMISTRY –I(LAB)</b> |  |
| 3 | <b>Credits</b>      | <b>1</b>                    |  |

|   |                              |   |            |
|---|------------------------------|---|------------|
| 4 | <b>Contact Hours (L-T-P)</b> | <b>0-0-2</b>  |            |
| 5 | Course Outcomes              | CO1: To understand the importance of laboratory apparatus<br>CO2: To understand the importance of different types of glass wares<br>CO3: To understand the importance of safety measures and lab protocols<br>CO4: To understand the importance of preparation of various sorts of solution<br>CO5: To understand the importance of acid and base titration |            |
| 6 | Course Description           | <ul style="list-style-type: none"> <li>• Introduction of Glassware's</li> <li>• Introduction of Laboratory Equipment's</li> <li>• Safety of measurements in Laboratory,</li> <li>• Preparation of Solutions</li> <li>• Determination of strength of acids and bases</li> </ul>  |            |
|   | <b>Practical's</b>           |   | CO mapping |
|   | <b>Unit 1</b>                | <b>Introduction to Laboratory apparatus</b>   | CO1        |
|   |                              | a. Introduction to Laboratory apparatus -1<br>b. Introduction to Laboratory apparatus -2<br>c. Maintenance of Laboratory apparatus -3   |            |
|   | <b>Unit 2</b>                | <b>Introduction to Laboratory glassware's</b>   | CO2        |
|   |                              | a. Introduction to Laboratory glassware's -1<br>b. Introduction to Laboratory glassware's -2<br>c. Maintenance of Laboratory glassware's  |            |
|   | <b>Unit 3</b>                | <b>Safety measures and Lab protocols</b>  | CO3        |
|   |                              | a. Safety measurements in Biochemistry lab<br>b. General laboratory protocols<br>c. Awareness in a lab  |            |
|   | <b>Unit 4</b>                | Preparation of acid and bases of different concentrations   | CO4        |

|  |  |   |     |     |
|--|--|---|-----|-----|
|  |  | <ul style="list-style-type: none"> <li>a. Preparation of acids of different concentration</li> <li>b. Preparation of bases of different concentration</li> <li>c. Preparation of solutions of different concentration</li> </ul>  |     |     |
|  | <b>Unit 5</b>                          | <b>Titration</b>  | CO5 |     |
|  |  | <ul style="list-style-type: none"> <li>a. Determination of the strength of NaOH solution</li> <li>b. Determination of the strength of HCl solution</li> <li>c. Determination of the strength of NH<sub>4</sub>OH solution</li> </ul>  |     |     |
|  | Mode of examination                    | Theory and Practical  |     |     |
|  | Weightage Distribution for Theory      | CA  | MTE | ETE |
|  |  | 30%   | 20% | 50% |
|  | Weightage Distribution for Practical's | CA  | MTE | ETE |
|  |  | 60%   | 0%  | 40% |
|  | Text book/s*                           | <ul style="list-style-type: none"> <li>1) A text book of Medical Biochemistry by Chatterjee &amp; Shinde</li> <li>2) Text book of biochemistry for Medical students by Vasudevan and Sreekumari</li> <li>3) Biochemistry by Lehninger</li> <li>4) Clinical chemistry by Varley</li> <li>5) Harpers Illustrated Biochemistry by Robert K.M.</li> </ul> |     |     |

|     | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 3   | 3   | 3   | 3   | 3   | 3   |
| CO2 | 3   | 3   | 2   | 3   | 3   | 3   |
| CO3 | 3   | 3   | 3   | 3   | 3   | 3   |
| CO4 | 3   | 3   | 3   | 3   | 3   | 3   |
| CO5 | 3   | 3   | 3   | 3   | 2   | 3   |

**BCT 114: Pathology & BCT 124: Pathology (Lab)**

|  |                          |   |  |
|--|--------------------------|---|--|
| <b>School: SAHS</b>                              |                          | <b>Batch : 2021-25</b>  |  |
| <b>Program: BCVT</b>                             |                          | <b>Current Academic Year: 2021-22</b>   |  |
| <b>Branch:<br/>Cardiovascular<br/>Technology</b> |                          | <b>Semester: 1</b>  |  |
| 1  | Course Code              | <b>BCT 114</b>  |  |
| 2  | Course Title             | <b>PATHOLOGY-I</b>  |  |
| 3  | Credits                  | <b>3</b>  |  |
| 4  | Contact Hours<br>(L-T-P) | <b>2-1-0</b>  |  |
|  | Course Status            | Compulsory  |  |
| 5  | Course Objective         | <ol style="list-style-type: none"> <li>1. Able to perform various techniques of histopathology and will have good concept of biomedical waste management.</li> <li>2. Able to perform urine examination, body fluid examination, CSF examination, sputum examination, stool examination etc.</li> <li>3. Able to perform certain blood tests in hematology.</li> <li>4. Able to apply knowledge of clinical pathology in the diagnosis</li> <li>5. Able to apply knowledge of clinical pathology in the management of disease.</li> </ol> |  |
| 6  | Course Outcomes          | <p>CO1: To understand the techniques of histopathology and biomedical waste management</p> <p>CO2: To understand the importance of various body fluid examinations</p> <p>CO3: To understand the importance of various blood test</p> <p>CO4: To understand the importance of correct diagnosis of disease by histopathological techniques</p> <p>CO5: To understand the importance of management of disease</p>  |  |
| 7  | Course                   | <ul style="list-style-type: none"> <li>• Histopathology</li> </ul>  |  |

|   |                                   |   |            |
|---|-----------------------------------|---|------------|
|   | Description                       | <ul style="list-style-type: none"> <li>• Clinical pathology</li> <li>• Hematology</li> </ul>  |            |
| 8 | Outline syllabus<br><b>Theory</b> |   | CO mapping |
|   | <b>Unit 1</b>                     | <b>Histopathology-1</b>   |            |
|   |                                   | a) Introduction to histopathology<br>Receiving of specimen in the laboratory<br>b) Grossing techniques<br>Mounting techniques – various moutants<br>c) Maintenance of records and filling of the slides                                   | CO1        |
|   | <b>Unit 2</b>                     | <b>Histopathology-2</b>   |            |
|   |                                   | a) Use & care of Microscope<br>b) Various Fixatives, Mode of action<br>c) Preparation and Indication of fixatives   | CO1        |
|   | <b>Unit 3</b>                     | <b>Histopathology-3</b>   |            |
|   |                                   | Bio-Medical waste management<br>a)Section Cutting<br>b)Tissue processing for routine paraffin sections<br>c)Decalcification of Tissues.<br>Staining of tissues - H& E Staining  | CO1, CO2   |
|   | <b>Unit 4</b>                     | <b>Clinical pathology-1</b>   |            |
|   |                                   | a) Introduction to Clinical Pathology<br>b) Collection, Transport, Preservation, and<br>c) Processing of various clinical specimens   | CO2, CO3   |
|   | <b>Unit 5</b>                     | <b>Clinical pathology-2</b>   |            |
|   |                                   | a) Urine Examination – Collection and Preservation of urine. Physical, chemical, Microscopic Examination<br>b) Examination of body fluids.<br>c) Examination of cerebro spinal fluid (CSF)<br>Sputum Examination.<br>Examination of feces | CO2, CO3   |
| 1 | <b>Course Code</b>                | <b>BCT124</b>   |            |
| 2 | <b>Course Title</b>               | <b>PATHOLOGY–I (LAB)</b>  |            |
| 3 | <b>Credits</b>                    | <b>1</b>  |            |
| 4 | <b>Contact Hours</b>              | <b>0-0-2</b>  |            |

|   |                                   |   |            |
|---|-----------------------------------|---|------------|
|   | <b>(L-T-P)</b>                    |   |            |
| 5 | Course Outcomes                   | CO1: To understand the importance of histopathology techniques<br>CO2: To understand the importance of use of microscope<br>CO3: To understand the importance of clinicopathological techniques<br>CO4: To understand the importance of haematological investigations<br>CO5: To understand the importance of maintenance of blood bank |            |
| 6 | Course Description                | <ul style="list-style-type: none"> <li>• Histopathology</li> <li>• Clinical pathology</li> <li>• Hematology</li> </ul>  |            |
|   | <b>Practical's</b>                |   | CO mapping |
|   | <b>Unit- 1</b>                    | a)Grossing techniques<br>b) Mounting techniques<br>c)Maintenance of records and filling of the slides   | CO1        |
|   | <b>Unit-2</b>                     | a) Use & care of Microscope<br>b) Various Fixatives, Mode of action<br>c) Preparation and Indication of fixatives   | CO2        |
|   | <b>Unit-3</b>                     | a)Section Cutting<br>b)Tissue processing for routine paraffin sections<br>c)Decalcification of Tissues.<br>Staining of tissues - H& E Staining  | CO2, CO3   |
|   | <b>Unit-4</b>                     | a) Urine examination-Physical<br>b) Urine examination-Chemical<br>c) Urine examination-Microscopic  | CO3, CO4   |
|   | <b>Unit 5</b>                     | a) Practical-1<br>b) Practical-2<br>c) Practical-3  | CO3, CO4   |
|   | Mode of examination               | Theory and Practical  |            |
|   | Weightage Distribution for Theory | CA<br>30%   | MTE<br>20% |
|   |                                   |   | ETE<br>50% |

|  | Weightage Distribution for Practical's | CA  | MTE | ETE |  |  |  |  |
|--|--|---|-----|-----|--|--|--|--|
|  |  | 60%   | 0%  | 40% |  |  |  |  |
|  | Text book/s*                           | 1. Culling Histopathology techniques<br>2. Bancroft Histopathology techniques<br>3. Koss – cytology<br>4. Winifred greg – Diagnostic cytopathology<br>5. Orell – Cyto Pathology<br>6. Todd & Sanford Clinical Diagnosis by laboratory method<br>7. Dacie & Lewis – Practical Haematology<br>8. Ramanic Sood, Laboratory Technology (Methods and interpretation) 4 <sup>th</sup> Ed. J.P. Bros, New Delhi –1996)<br>9. Satish Gupta Short text book of Medical Laboratory for technician J.P. Bros, New Delhi – 1998<br>10. Sachdev K.N. Clinical Pathology and Bacteriology 8 <sup>th</sup> Ed, J.P. Bros<br>11. Krishna - Text book of Pathology, Orient Longman PVT Ltd. Bacteriology 8 <sup>th</sup> Ed, J.P. Bros, New Delhi-1991 |     |     |  |  |  |  |

|     |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 3 |

|     |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 |

**BCT 115: Microbiology I & BCT 125: Microbiology I (Lab)**

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|--|-----------------------|--|--|
| <b>School: SAHS</b>                      |                       | <b>Batch : 2021-25</b>   |  |
| <b>Program: BCVT</b>                     |                       | <b>Current Academic Year: 2021-22</b>  |  |
| <b>Branch: Cardiovascular Technology</b> |                       | <b>Semester: 1</b>   |  |
| 1  | Course Code           | <b>BCT 115</b>   |  |
| 2  | Course Title          | <b>MICROBIOLOGY-I</b>  |  |
| 3  | Credits               | <b>3</b>   |  |
| 4  | Contact Hours (L-T-P) | <b>2-1-0</b>   |  |
|  | Course Status         | Compulsory   |  |
| 5  | Course Objective      | <ol style="list-style-type: none"><li>1. Able to collect and dispatch specimen for routine investigation</li><li>2. Able to interpret commonly done bacteriological and serological investigations</li><li>3. Able to control hospital infections</li><li>4. Able to manage biomedical waste management</li><li>5. Able to understand immunisation schedule</li></ol>                                |  |
| 6  | Course Outcomes       | CO1: To understand the techniques of specimen collection<br>CO2: To understand the importance of bacteriological and serological investigations<br>CO3: To understand the importance of nosocomial infection complication<br>CO4: To understand the importance of biochemical waste management<br>CO5: To understand the importance microscopy and their handling techniques and staining procedures |  |
| 7  | Course Description    | <ul style="list-style-type: none"><li>• Classification, growth and nutrition of microorganism</li><li>• Sterilisation and disinfection</li><li>• Immunology</li><li>• Systemic bacteriology</li><li>• Parasitology</li></ul>   |  |



|   |                                   |   |               |
|---|-----------------------------------|---|---------------|
|   |                                   | <ul style="list-style-type: none"> <li>• Mycology</li> <li>• Virology</li> <li>• Hospital infection</li> <li>• Biomedical waste management</li> </ul>   |               |
| 8 | Outline syllabus<br><b>Theory</b> |   | CO mapping    |
|   | <b>Unit 1</b>                     | <b>Classification of microorganism</b>  |               |
|   |                                   | a) Classification of microorgaisms,<br>b) size, shape and structure of bacteria.<br>c) Use of microscope in the study of bacteria   | CO1           |
|   | <b>Unit 2</b>                     | <b>Growth and nutrition</b>   |               |
|   |                                   | a) Nutrition of bacteria<br>b) growth and multiplications of bacteria,<br>c) use of culture media in diagnostic bacteriology  | CO1, CO2      |
|   | <b>Unit 3</b>                     | <b>Sterilisation and Disinfection</b>   |               |
|   |                                   | a) Principles and use of equipments of sterlization namely Hot Air oven, Autoclave and serum inspissator.<br>b) Pasteurization, Antiseptic and disinfectants.<br>c) Antimicrobial test                            | CO1, CO2      |
|   | <b>Unit 4</b>                     | <b>Immunology</b>   |               |
|   |                                   | a) Immunity vaccines, types of vaccine and immunization schedule<br>b) Principles and interpretation of commonly done serological tests namely Wida, VDRL,ASLO,CRP,RF & ELISA<br>c) Rapid tests for HIV and HbsAg | CO1, CO2, CO3 |
|   | <b>Unit 5</b>                     |   |               |
|   |                                   | <b>Parasitology</b>   | CO2, CO3      |
|   | a)                                | b) Morphology, life cycle, laboratory diagnosis of following parasitesE. histolytica,<br>c) Plasmodium,<br>d) Tape worms, Intestinal nematodes  |               |
| 1 | <b>Course Code</b>                | <b>BCT125</b>   |               |
| 2 | <b>Course Title</b>               | <b>MICROBIOLOGY–I (LAB)</b>   |               |
| 3 | <b>Credits</b>                    | <b>1</b>  |               |
| 4 | <b>Contact Hours (L-T-P)</b>      | <b>0-0-2</b>  |               |
| 5 | Course Outcomes                   | CO1: To understand the importance of compound microscopy<br>CO2: To understand the importance of sterilization<br>CO3: To understand the importance of serological tests  |               |

|   |  |  |            |
|---|--|--|------------|
|   |  | CO4: To understand the importance of gram staining<br>CO5: To understand the importance of biomedical waste management   |            |
| 6 | Course Description                     | <ul style="list-style-type: none"> <li>• Microscopy</li> <li>• Clinical pathology</li> <li>• Hematology</li> </ul>   |            |
|   | <b>Practical's</b>                     |  | CO mapping |
|   | <b>Unit- 1</b>                         | a) Handling of microscope<br>b) Use of microscope<br>c) Safety measures  | CO1        |
|   | <b>Unit-2</b>                          | a) Use of culture media<br>b) Nutrient broth, nutrient agar, blood agar<br>c) Chocolate agar, Mac conkey medium, LJ media, Robertson Cooked meat media, Potassium tellurite media with growth, | CO1,CO2    |
|   | <b>Unit-3</b>                          | a) Demonstration and sterilization of equipments – Hot Air oven, Autoclave, Bacterial filters<br>b) Mac with LF & NLF, NA with staph<br>Antibiotic susceptibility test<br>c) Other             | CO2        |
|   | <b>Unit-4</b>                          | Demonstration of common serological tests<br>–<br>a) Widal,<br>b) VRDL,<br>c) ELISA  | CO2,CO3    |
|   | <b>Unit 5</b>                          | a) Gram staining<br>b) Acid fast staining<br>c) Applied  | CO3,CO4    |
|   | Mode of examination                    | Theory and Practical   |            |
|   | Weightage Distribution for Theory      | CA<br>30%  | MTE<br>20% |
|   | Weightage Distribution for Practical's | CA<br>60%  | MTE<br>0%  |
|   |  | ETE<br>50%   | ETE<br>40% |

|              |   |
|--------------|---|
| Text book/s* | <ol style="list-style-type: none"> <li>1. Anathanarayana &amp; Panikar Medical Microbiology</li> <li>2. Roberty Cruckshank – Medical Microbiology – The Practice of Medical Mircrobiology</li> <li>3. Chatterjee – Parasitology – Interpretation to Clinical medicine</li> <li>4. Rippon – Medical Mycology</li> <li>5. Emmons – Medical mycology</li> <li>6. Basic laboratory methods in Parasitology, 1<sup>st</sup> Ed, J P Bros, New Delhi</li> <li>7. Basic laboratory procedures in clinical bacteriology, 1<sup>st</sup> Ed, J P Brothers</li> <li>8. Medical Parasitology – Ajit Damle</li> </ol> |
|--------------|---|

|     |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 3 |

|     |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 |

### **BCT 116: Basics of Hospital and Data Management - I**

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|  |                       |   |  |
|--|-----------------------|---|--|
| <b>School: SAHS</b>                      |                       | <b>Batch : 2021-25</b>                        |  |
| <b>Program: BCVT</b>                     |                       | <b>Current Academic Year: 2021-22</b>         |  |
| <b>Branch: Cardiovascular Technology</b> |                       | <b>Semester: 1</b>                            |  |
| 1  | Course Code           | <b>BCT 116</b>                                |  |
| 2  | Course Title          | <b>Basics of Hospital and Data Management</b> |  |
| 3  | Credits               | <b>3</b>                                      |  |
| 4  | Contact Hours (L-T-P) | <b>2-1-0</b>                                  |  |

SU/SAHS/BCVT

|   |                    |  |            |
|---|--------------------|--|------------|
|   | Course Status      | Compulsory   |            |
| 5 | Course Objective   | <ol style="list-style-type: none"> <li>1. Able to understand the techniques management and organizational behaviour</li> <li>2. Able to understand the quality control and hospital information system</li> <li>3. Able to understand the principle of CDM</li> <li>4. Able to know data management</li> <li>5. Able to manage material and inventory control, storage, equipment/operation .</li> </ol>   |            |
| 6 | Course Outcomes    | <p>CO1: To understand the techniques management and organizational behaviour</p> <p>CO2: To understand the importance of quality control and hospital information system</p> <p>CO3: To understand the importance of CDM</p> <p>CO4: To understand the importance of documents in data management and material management and inventory control</p> <p>CO5: To understand the importance of storage techniques and equipments/operation management</p> |            |
| 7 | Course Description | <ul style="list-style-type: none"> <li>• Introduction to Management</li> <li>• Organizational behaviour</li> <li>• Quality Control</li> <li>• Hospital Information System</li> <li>• Introduction and Principles of CDM</li> <li>• Documents in data Management</li> <li>• Material management and Inventory Control</li> <li>• Storage</li> <li>• Equipment/ Operations management</li> </ul>   |            |
| 8 | Outline syllabus   |  | CO mapping |
|   | <b>Theory</b>      |  |            |
|   | <b>Unit 1</b>      | <b>Introduction to Management:</b>   |            |
|   |                    | <ol style="list-style-type: none"> <li>a) Definition, Concepts,</li> <li>b) Principles, various models,</li> <li>c) Management components i.e. Planning, Organizing, Staffing, Motivating, Leading, Co-ordination and Controlling.</li> </ol>  | CO1        |

|  |  |  |     |     |     |
|--|--|--|-----|-----|-----|
|  | <b>Unit 2</b>                          | <b>Organizational behaviour</b>  |     |     |     |
|  |  | a) Concept of Organizational Behaviour<br>b) Major Components of organizational behaviour<br>– Personality development, Motivation, Group, Leadership,<br>c) Cooperation and Conflict                                    |     |     | CO1 |
|  | <b>Unit 3</b>                          | <b>Quality Control:</b>  |     |     |     |
|  |  | a) Definition of Quality, Dimensions of Quality,<br>b) Basic concepts of Total Quality Management,<br>c) Quality Awards  |     |     | CO2 |
|  | <b>Unit 4</b>                          | <b>Hospital Information System:</b>  |     |     |     |
|  |  | a) Hospital Information System<br>b) Management and software applications in registration, billing, investigations, reporting, medical records management, information processing,<br>c) Security and ethical challenges |     |     | CO2 |
|  | <b>Unit 5</b>                          | <b>Introduction and Principles of CDM:</b>   |     |     |     |
|  |  | a) CDM Process; Data entry methods of CDM;<br>b) SOPs on CDM; Data coding and decoding;<br>c) Medical Dictionaries   |     |     | CO3 |
|  |  |  |     |     |     |
|  | Mode of examination                    | Theory and Practical   |     |     |     |
|  | Weightage Distribution for Theory      | CA   | MTE | ETE |     |
|  |  | 30%  | 20% | 50% |     |
|  | Weightage Distribution for Practical's | CA   | MTE | ETE |     |
|  |  | 60%  | 0%  | 40% |     |
|  | Text book/s*                           |  |     |     |     |

|     |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 3 |

**BCT211 – HUMAN ANATOMY-II&BCT221 – HUMAN ANATOMY-II (Lab)**

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|  |                          |                                       |  |
|--|--------------------------|---------------------------------------|--|
| <b>School: SAHS</b>                              |                          | <b>Batch : 2021-25</b>                |  |
| <b>Program: BCVT</b>                             |                          | <b>Current Academic Year: 2021-22</b> |  |
| <b>Branch:<br/>Cardiovascular<br/>Technology</b> |                          | <b>Semester: 2</b>                    |  |
| 1  | Course Code              | <b>BCT 211</b>                        |  |
| 2  | Course Title             | <b>HUMAN ANATOMY-II</b>               |  |
| 3  | Credits                  | <b>3</b>                              |  |
| 4  | Contact Hours<br>(L-T-P) | <b>2-1-0</b>                          |  |
|  | Course Status            | Compulsory                            |  |

|   |                    |  |  |
|---|--------------------|--|--|
| 5 | Course Objective   | <p>5) To provide an opportunity for lab technologists who distinguish themselves in Human Anatomy - dissection consistency, theoretical knowledge and knowledge application, to undertake research based training in Anatomy.</p> <p>6) To capture distinguished medical students and offer them such training as would enable them to sub-specialize in anatomy at an early stage of their career.</p> <p>7) To develop as research scientists and research based teachers for schools of allied health sciences both locally and externally.</p> <p>8) It also strengthens the research foundation of the students with broad vision of leading in research based teaching of anatomy and stimulates the research attitudes and aptitudes of students.</p> |  |
| 6 | Course Outcomes    | <p>CO1: To understand the anatomy of Urinary system</p> <p>CO2: To understand the importance of Reproductive system</p> <p>CO3: To understand the position and function of Endocrine glands</p> <p>CO4: To understand the importance of parts of Nervous system</p> <p>CO5: To understand the importance and location of sensory organs</p>  |  |
| 7 | Course Description | <ul style="list-style-type: none"> <li>• Urinary system</li> <li>• Reproductive system</li> <li>• Endocrine glands</li> </ul>  |  |

|   |                                   |   |            |
|---|-----------------------------------|---|------------|
|   |                                   | <ul style="list-style-type: none"> <li>• Nervous system</li> <li>• Sensory organs</li> </ul>  |            |
| 8 | Outline syllabus<br><b>Theory</b> |   | CO mapping |
|   | <b>Unit 1</b>                     | <b>Urinary system</b>   | CO1, CO2   |
|   |                                   | <ol style="list-style-type: none"> <li>1. Description in brief Urinary system</li> <li>2. Kidney, ureter, urinary bladder, male and female urethra</li> <li>3. Histology of kidney, ureter and urinary bladder</li> </ol>   |            |
|   | <b>Unit 2</b>                     | <b>Reproductive system</b>  | CO1, CO2   |
|   |                                   | <ol style="list-style-type: none"> <li>1. Parts of male reproductive system, testis, vasdeferens and epididymis (gross and histology)</li> <li>2. Parts of female reproductive system, ovary (gross and histology), fallopian tube, uterus and mammary gland gross.</li> <li>3. Embryology: gametogenesis, ovulation, fertilization.</li> <li>4. Prostate gland, Mammary gland, Fetal circulation, Placenta.</li> </ol> |            |
|   | <b>Unit 3</b>                     | <b>Endocrine glands</b>   | CO1, CO3   |
|   |                                   | <ol style="list-style-type: none"> <li>1. Name of all endocrine glands in detail</li> <li>2. Pituitary gland and thyroid gland in detail</li> <li>3. Parathyroid gland, suprarenal gland (gross and histology)</li> </ol>   |            |
|   | <b>Unit 4</b>                     | <b>Nervous system</b>   | CO1, CO4   |
|   |                                   | <ol style="list-style-type: none"> <li>1. Neuron, Classification of Nervous system, Cerebrum, cerebellum, midbrain, pons, medulla oblongata.</li> <li>2. Spinal cord with spinal nerve, Meninges, Ventricles and cerebrospinal fluid</li> <li>3. Names of basal nuclei, Blood supply of brain, Cranial nerves, Sympathetic trunk and parasympathetic ganglia</li> </ol>   |            |



|   |                              |  |            |
|---|------------------------------|--|------------|
|   | <b>Unit 5</b>                | <b>Sensory organ</b>   | CO1, CO5   |
|   |                              | <ol style="list-style-type: none"> <li>1. Skin: Skin histology, Appendages of skin</li> <li>2. Eye: parts of eye, extra ocular muscle and blood supply</li> <li>3. Ear: parts of external, middle and internal ear with contents.</li> </ol>   |            |
| 1 | <b>Course Code</b>           | <b>BCT221</b>  |            |
| 2 | <b>Course Title</b>          | <b>HUMAN ANATOMY –II (LAB)</b>   |            |
| 3 | <b>Credits</b>               | <b>1</b>   |            |
| 4 | <b>Contact Hours (L-T-P)</b> | <b>0-0-2</b>   |            |
| 5 | Course Outcomes              | CO1: To know about the importance of urinary system<br>CO2: To know the location and importance of glands<br>CO3: To know the importance and role of different types of nerves<br>CO4: To know the importance and parts of Brain<br>CO5: To know the importance and location of Sensory organs |            |
| 6 | Course Description           | <ul style="list-style-type: none"> <li>• Reflections and urinary system</li> <li>• Different types of endocrine glands</li> <li>• Different types of nerves</li> <li>• Brain and its part along with function</li> <li>• Sensory organs such as skin and eye</li> </ul>                        |            |
|   | <b>Practical's</b>           |  | CO mapping |
|   | <b>Unit 1</b>                | <ol style="list-style-type: none"> <li>a. Demonstration of parts of urinary system</li> <li>b. Histology of kidney, ureter and urinary bladder</li> <li>c. Radiograph related to urinary system</li> </ol>   | CO1, CO2   |
|   | <b>Unit 2</b>                | <ol style="list-style-type: none"> <li>a. Demonstration of reproductive organ</li> <li>b. Radiograph related to reproductive system</li> </ol>   | CO1, CO2   |
|   | <b>Unit 3</b>                | <ol style="list-style-type: none"> <li>a. Demonstration of eyeball</li> <li>b. Histology of eyeball</li> </ol>   | CO1, CO3   |
|   | <b>Unit 4</b>                | <ol style="list-style-type: none"> <li>a. Demonstration of glands</li> <li>b. Histology of pituitary gland and thyroid gland.</li> </ol>   | CO1, CO4   |

|  |  |  |     |     |          |
|--|--|--|-----|-----|----------|
|  |  | c. Histology of parathyroid and suprarenal gland.  |     |     |          |
|  | <b>Unit 5</b>                          | a. Histology of thick skin<br>b. Histology of thin skin<br>c. Demonstration of brain and spinal cord   |     |     | CO1, CO5 |
|  | Mode of examination                    | Theory and Practical   |     |     |          |
|  | Weightage Distribution for Theory      | CA   | MTE | ETE |          |
|  |  | 30%  | 20% | 50% |          |
|  | Weightage Distribution for Practical's | CA   | MTE | ETE |          |
|  |  | 60%  | 0%  | 40% |          |
|  | Text book/s*                           | 4) Understanding Human Anatomy and Physiology by William Davis<br>5) A text book of Anatomy by BD Chaurasia<br>6) A text book of human Anatomy by T.S. Ranganathan |     |     |          |

|     |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 3 |

|     |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 3 |

### **BCT212 – HUMAN PHYSIOLOGY-II & BCT222 – HUMAN PHYSIOLOGY-II (Lab)**

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|                      |                                       |  |
|----------------------|---------------------------------------|--|
| <b>School: SAHS</b>  | <b>Batch : 2021-25</b>                |  |
| <b>Program: BCVT</b> | <b>Current Academic Year: 2021-22</b> |  |

SU/SAHS/BCVT

|  |                       |   |  |
|--|-----------------------|---|--|
| <b>Branch: Cardiovascular Technology</b> |                       | <b>Semester: 2</b>  |  |
| 1  | Course Code           | <b>BCT 212</b>  |  |
| 2  | Course Title          | <b>Human Physiology-II</b>  |  |
| 3  | Credits               | <b>3</b>  |  |
| 4  | Contact Hours (L-T-P) | <b>2-1-0</b>  |  |
|  | Course Status         | Compulsory  |  |
| 5  | Course Objective      | <ul style="list-style-type: none"> <li>• To learn and understand the fundamental scientific concepts relating to a broad range of topics in human physiology.</li> <li>• To make the students familiar with the basic factual information concerning the mechanisms and functioning of humans body system.</li> <li>• To develop investigative skills and to become familiar with standard techniques of measurement.</li> <li>• To help the students to gain practice and confidence in applying this knowledge, in a quantitative manner where appropriate, to actual experiments.</li> </ul> |  |
| 6  | Course Outcomes       | <p>CO1: To understand the importance, function and function of Excretory system of body</p> <p>CO2: To get the information about Endocrine system</p> <p>CO3: To understand the Nervous system and its function</p> <p>CO4: To understand the reproductive system and its</p>   |  |

|   |                                   |   |            |
|---|-----------------------------------|---|------------|
|   |                                   | function<br>CO5:To know about special senses of the body  |            |
| 7 | Course Description                | <ul style="list-style-type: none"> <li>• Physiology of Excretion system</li> <li>• Endocrine system</li> <li>• Nervous system</li> <li>• Reproductive system</li> <li>• Special Senses</li> </ul>   |            |
| 8 | Outline syllabus<br><b>Theory</b> |   | CO mapping |
|   | <b>Unit 1</b>                     | <b>Excretory system</b>   | CO1, CO2   |
|   |                                   | 1. Physiological anatomy of kidney, structure and functions of excretory system, structure of nephron.<br>2. Mechanism of formation of Urine. & mechanism of concentration and dilution of urine.<br>3. The Counter Current System: Physiology of micturition and Regulation of Body Temperature in Humans. |            |
|   | <b>Unit 2</b>                     | <b>Endocrine system</b>   | CO1, CO2   |
|   |                                   | 1. General principles of endocrinology, The pituitary Gland.<br>2. The Thyroid Gland, The parathyroid, Calcitonin and Vitamin D.<br>3. The Adrenal Cortex & Pancreas.   |            |
|   | <b>Unit 3</b>                     | <b>Reproductive system</b>  | CO1, CO3   |

|  |               |  |          |
|--|---------------|--|----------|
|  |               | <ol style="list-style-type: none"> <li>1. Changes during Puberty, Classification of Male sex hormones and their functions, Spermatogenesis &amp; semen.</li> <li>2. Changes during Puberty, Classification and Functions of female sex hormones, menstruation, ovulation and contraception.</li> <li>3. Physiological changes during pregnancy, functions of placenta and physiology of lactation.</li> </ol>  |          |
|  | <b>Unit 4</b> | <b>Nervous system</b>  | CO1, CO4 |
|  |               | <ol style="list-style-type: none"> <li>1. Organisation of Nervous system, The Synapse , Physiology of receptor organs for special and general sensation, physiology of reflex action, classification and properties of reflexes.</li> <li>2. Intro to Sensory and motor system. Functions of hypothalamus, thalamus, basal ganglia, cerebrum &amp; cerebellum.</li> <li>3. Autonomic nervous system, Cerebrospinal Fluid and Blood Brain Barrier.</li> </ol> |          |
|  | <b>Unit 5</b> | <b>Special Senses</b>  | CO1, CO5 |
|  |               | <ol style="list-style-type: none"> <li>1. Taste and Olfaction.</li> <li>2. Vision—structure and function of eye, errors of refraction &amp; their correction. Colour blindness.</li> </ol>   |          |

|   |                              |   |            |
|---|------------------------------|---|------------|
|   |                              | 3. Hearing—structure and function of ear, general outline of mechanism of hearing and perception of sound.  |            |
| 1 | <b>Course Code</b>           | <b>BCT 222</b>  |            |
| 2 | <b>Course Title</b>          | <b>HUMAN PHYSIOLOGY –II (LAB)</b>   |            |
| 3 | <b>Credits</b>               | <b>1</b>  |            |
| 4 | <b>Contact Hours (L-T-P)</b> | <b>0-0-2</b>  |            |
| 5 | Course Outcomes              | CO1: To know about importance of DLC estimation<br>CO2: To know the importance of TLC estimation<br>CO3: To know the importance of arterial blood pressure measurement<br>CO4: To know the importance of Radial pulse measurement<br>CO5: To know the importance of Blood indices measurement |            |
| 6 | Course Description           | <ul style="list-style-type: none"> <li>• Differential Leucocyte Count.</li> <li>• Arterial Blood Pressure</li> <li>• Radial pulse.</li> <li>• Blood indices</li> <li>• Effect of posture on blood pressure</li> </ul>   |            |
|   | <b>Practical's</b>           |   | CO mapping |
|   | <b>Unit 1</b>                | <b>Differential Leucocyte Count -1</b>  | CO1, CO2   |
|   |                              | <ul style="list-style-type: none"> <li>a. Briefing</li> <li>b. Demonstration</li> <li>c. Practical –Preparation of Blood Smear</li> </ul>   |            |
|   | <b>Unit 2</b>                | <b>Differential Leucocyte Count -2</b>  | CO1, CO2   |
|   |                              | <ul style="list-style-type: none"> <li>a. Staining of smear</li> <li>b. Fixation of smear</li> <li>c. Identification of cells</li> </ul>  |            |

|  |  |   |     |     |          |
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|  | <b>Unit 3</b>                          | <b>Arterial Blood Pressure measurement</b>  |     |     | CO1, CO3 |
|  |  | a. Briefing<br>b. Demonstration<br>c. Practical   |     |     |          |
|  | <b>Unit 4</b>                          | <b>Radial Pulse measurement</b>   |     |     | CO1, CO4 |
|  |  | a. Briefing<br>b. Demonstration<br>c. Practical   |     |     |          |
|  | <b>Unit 5</b>                          | <b>Effect of posture on Blood pressure</b>  |     |     | CO1, CO5 |
|  |  | a. Briefing<br>b. Demonstration<br>c. Practical   |     |     |          |
|  | Mode of examination                    | Theory and Practical's  |     |     |          |
|  | Weightage Distribution for Theory      | CA  | MTE | ETE |          |
|  |  | 30%   | 20% | 50% |          |
|  | Weightage Distribution for Practical's | CA  | MTE | ETE |          |
|  |  | 60%   | 0%  | 40% |          |
|  | Text book/s*                           | 1. Text book of Physiology by Guyton<br>2. Human Physiology by Chatterjee<br>3. Concise Medical Physiology by sujith K Choudhary<br>4. Review of Medical Physiology by Ganong<br>5. A text book of Physiology by A.K.Jain |     |     |          |

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|-----|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 3 |

|     |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 |

|     |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 3 |

### **BCT213: BIOCHEMISTRY- I &BCT 223: BIOCHEMISTRY- I (Lab)**

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|                                       |                       |   |  |
|---------------------------------------|-----------------------|---|--|
| <b>School: SAHS</b>                   |                       | <b>Batch :2021-25</b>   |  |
| <b>Program: BMLT</b>                  |                       | <b>Current Academic Year: 2020-21</b>   |  |
| <b>Branch: Medical Lab Technology</b> |                       | <b>Semester: 2</b>  |  |
| 1                                     | Course Code           | <b>BCT 213</b>  |  |
| 2                                     | Course Title          | <b>BIOCHEMISTRY -II</b>   |  |
| 3                                     | Credits               | <b>3</b>  |  |
| 4                                     | Contact Hours (L-T-P) | <b>2-1-0</b>  |  |
|                                       | Course Status         | Compulsory  |  |
| 5                                     | Course Objective      | <ul style="list-style-type: none"> <li>• To train the students in the management of medical laboratory along with handling a variety of laboratory chemicals and instruments including electronic and advanced equipment's used in modern medical laboratories.</li> <li>• To make the students able to do routine laboratory testing under stipulated conditions.</li> <li>• To prepare specimens and operate machines that automatically analyze samples.</li> <li>• To provide the conceptual basis for understanding biochemical and particularly address the fundamental mechanisms of the biomolecules to facilitate the life.</li> <li>• To develop diagnostic skills in clinical biochemistry and to provide an advanced</li> </ul> |  |



|   |                                   |  |            |
|---|-----------------------------------|--|------------|
|   |                                   | understanding of the core principles and topics of Biochemistry and their experimental basis.  |            |
| 6 | Course Outcomes                   | CO1: To understand the importance of amino acid chemistry<br>CO2: To understand the importance of Enzymes<br>CO3: To understand the importance of Minerals<br>CO4: To understand the importance of vitamins<br>CO5: To understand the importance of cell biology and chemistry of nucleic acid   |            |
| 7 | Course Description                | <ul style="list-style-type: none"> <li>• Amino-acid Chemistry</li> <li>• Enzymes</li> <li>• Mineral metabolism</li> <li>• Vitamins</li> <li>• Cell Biology, Nucleotide and Nucleic acid Chemistry</li> </ul>   |            |
| 8 | Outline syllabus<br><b>Theory</b> |  | CO mapping |
|   | <b>Unit 1</b>                     | <b>Amino-acid Chemistry</b>  | CO1        |
|   |                                   | <ol style="list-style-type: none"> <li>1. Amino acid chemistry: Definition, Classification, Peptide bonds. Peptides: Definition, Biologically important peptides.</li> <li>2. Protein chemistry: Definition, Classification, Functions of proteins,</li> <li>3. Primary, Secondary, tertiary and quaternary structure of proteins</li> </ol> |            |
|   | <b>Unit 2</b>                     | <b>Enzymes</b>   | CO2        |
|   |                                   | <ol style="list-style-type: none"> <li>1. Definition, Active site, Cofactor (Coenzyme, Activator), Proenzyme. Classification with examples, Factors effecting enzyme activity.</li> <li>2. Enzyme inhibition and significance,</li> <li>3. Isoenzymes, Diagnostic enzymology (clinical significance of enzymes)</li> </ol>                   |            |
|   | <b>Unit 3</b>                     | <b>Mineral metabolism</b>  | CO3        |
|   |                                   | <ol style="list-style-type: none"> <li>1. Definition, Sources, RDA, absorption, transport, and excretion of various minerals.</li> <li>2. Functions of various minerals</li> <li>3. Disorder of various minerals (Sodium, Potassium,</li> </ol>  |            |

|  |               |   |     |
|--|---------------|---|-----|
|  |               | Calcium, Phosphate, Sulphur, Iron, Magnesium, Fluoride, Selenium, Zinc and Copper)  |     |
|  | <b>Unit 4</b> | <b>Vitamins</b>   | CO4 |
|  |               | <ol style="list-style-type: none"> <li>1. Definition, classification according to solubility, Sources and Coenzyme forms of different vitamins</li> <li>2. Functions, RDA, digestion, absorption and transport of various vitamins.</li> <li>3. Deficiency and toxicity of various vitamins</li> </ol>  |     |
|  | <b>Unit 5</b> | <b>Cell Biology, Nucleotide and Nucleic acid Chemistry</b>  | CO5 |
|  |               | <ol style="list-style-type: none"> <li>1. Cell structure, Cell membrane structure and function, various types of absorption. Intracellular organelles and their functions, briefly on cytoskeleton.</li> <li>2. Nucleotide chemistry: Nucleotide composition, functions of free nucleotides in body.</li> <li>3. Nucleic acid (DNA and RNA) chemistry: Difference between DNA and RNA, Structure of DNA (Watson and Crick model), Functions of DNA. Structure and functions of tRNA, rRNA, mRNA.</li> </ol> |     |

|     | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 3   | 3   | 3   | 3   | 3   | 3   |
| CO2 | 3   | 3   | 2   | 3   | 3   | 3   |
| CO3 | 3   | 3   | 3   | 3   | 3   | 3   |
| CO4 | 3   | 3   | 3   | 3   | 3   | 3   |
| CO5 | 3   | 3   | 3   | 3   | 2   | 3   |

|   |                    |                |  |
|---|--------------------|----------------|--|
| 1 | <b>Course Code</b> | <b>BCT 223</b> |  |
|---|--------------------|----------------|--|

SU/SAHS/BCVT

|   |                              |   |            |
|---|------------------------------|---|------------|
| 2 | <b>Course Title</b>          | <b>BIOCHEMISTRY –II(LAB)</b>  |            |
| 3 | <b>Credits</b>               | <b>1</b>  |            |
| 4 | <b>Contact Hours (L-T-P)</b> | <b>0-0-2</b>  |            |
| 5 | Course Outcomes              | CO1: To understand the importance of different types of acids<br>CO2: To understand the importance of different types of bases<br>CO3: To understand the importance of different types of solutions<br>CO4: To understand the importance of carbohydrates<br>CO5: To understand the importance of proteins                    |            |
| 6 | Course Description           | <ul style="list-style-type: none"> <li>• Preparation of acids of different concentration:</li> <li>• Preparation of bases of different concentration:</li> <li>• Preparation of solutions of different concentration:</li> <li>• Qualitative analysis of Carbohydrates</li> <li>• Qualitative analysis of Proteins</li> </ul> |            |
|   | <b>Practical's</b>           |   | CO mapping |
|   | <b>Unit 1</b>                | a. Preparation of acids of different concentration-1<br>b. Preparation of acids of different concentration-2<br>c. Preparation of acids of different concentration-3  | CO1        |
|   | <b>Unit 2</b>                | a) Preparation of bases of different concentration-1<br>b) Preparation of bases of different concentration-2<br>c) Preparation of bases of different concentration-3  | CO2        |
|   | <b>Unit 3</b>                | a. Preparation of solutions of different concentration-1<br>b. Preparation of solutions of different concentration-2<br>c. Preparation of solutions of different concentration-3  | CO3        |
|   | <b>Unit 4</b>                | a) Qualitative analysis of Carbohydrates-1<br>b) Qualitative analysis of Carbohydrates-2<br>c) Qualitative analysis of Carbohydrates-3  | CO4        |

|  |  |   |     |     |     |
|--|--|---|-----|-----|-----|
|  | <b>Unit 5</b>                          | a) Qualitative analysis of Proteins-1<br>b) Qualitative analysis of Proteins-2<br>c) Qualitative analysis of Proteins-3   |     |     | CO5 |
|  | Mode of examination                    | Theory and Practical  |     |     |     |
|  | Weightage Distribution for Theory      | CA  | MTE | ETE |     |
|  |  | 30%   | 20% | 50% |     |
|  | Weightage Distribution for Practical's | CA  | MTE | ETE |     |
|  |  | 60%   | 0%  | 40% |     |
|  | Text book/s*                           | <ol style="list-style-type: none"> <li>1. A text book of Medical Biochemistry by Chatterjee &amp; Shinde</li> <li>2. Text book of biochemistry for Medical students by Vasudevan and Sreekumari</li> <li>3. Biochemistry by Lehninger</li> <li>4. Clinical chemistry by Varley</li> <li>5. Harpers Illustrated Biochemistry by Robert K.M.</li> </ol> |     |     |     |

|     | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 3   | 3   | 3   | 3   | 3   | 3   |
| CO2 | 3   | 3   | 2   | 3   | 3   | 3   |
| CO3 | 3   | 3   | 3   | 3   | 3   | 3   |
| CO4 | 3   | 3   | 3   | 3   | 3   | 3   |
| CO5 | 3   | 3   | 3   | 3   | 2   | 3   |

### **BCT 214: Pathology & BCT 224: Pathology (Lab)**

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|  |                                       |  |
|--|---------------------------------------|--|
| <b>School: SAHS</b>                              | <b>Batch : 2021-25</b>                |  |
| <b>Program: BCVT</b>                             | <b>Current Academic Year: 2021-22</b> |  |
| <b>Branch:<br/>Cardiovascular<br/>Technology</b> | <b>Semester: 2</b>                    |  |

|   |                          |   |            |
|---|--------------------------|---|------------|
| 1 | Course Code              | <b>BCT 214</b>  |            |
| 2 | Course Title             | <b>PATHOLOGY-II</b>   |            |
| 3 | Credits                  | <b>3</b>  |            |
| 4 | Contact Hours<br>(L-T-P) | <b>2-1-0</b>  |            |
|   | Course Status            | Compulsory  |            |
| 5 | Course Objective         | <p>6. Able to perform various techniques of histopathology and will have good concept of biomedical waste management.</p> <p>7. Able to perform urine examination, body fluid examination, CSF examination, sputum examination, stool examination etc.</p> <p>8. Able to perform certain blood tests in hematology.</p> <p>9. Able to apply knowledge of clinical pathology in the diagnosis</p> <p>10. Able to apply knowledge of clinical pathology in the management of disease.</p> |            |
| 6 | Course Outcomes          | <p>CO1: To understand the techniques of histopathology and biomedical waste management</p> <p>CO2: To understand the importance of various body fluid examinations</p> <p>CO3: To understand the importance of various blood test</p> <p>CO4: To understand the importance of correct diagnosis of disease by histopathological techniques</p> <p>CO5: To understand the importance of management of disease</p>  |            |
| 7 | Course Description       | <ul style="list-style-type: none"> <li>• Histopathology</li> <li>• Clinical pathology</li> <li>• Hematology</li> </ul>  |            |
| 8 | Outline syllabus         |   | CO mapping |
|   | <b>Theory</b>            |   |            |
|   | <b>Unit 1</b>            | <b>Hematology-1</b>   |            |
|   |                          | <p>a) Introduction to Haematology</p> <p>b) Normal constituents of Blood, their structure and function</p> <p>c) Applied</p>  | CO1        |
|   | <b>Unit 2</b>            | <b>Hematology-2</b>   |            |
|   |                          | <p>a) Collection of Blood samples</p> <p>b) Various Anticoagulants used in Haematology</p>  | CO1        |

|   |                              |   |            |
|---|------------------------------|---|------------|
|   |                              | c) Various instruments and glassware used in Haematology, Preparation and use of glassware  |            |
|   | <b>Unit 3</b>                | <b>Hematology-3</b>   |            |
|   |                              | a) Laboratory safety guidelines<br>b) SI units and conventional units in Hospital Laboratory<br>c) Hb,PCV,ESR   | CO1, CO2   |
|   | <b>Unit 4</b>                | <b>Hematology-4</b>   |            |
|   |                              | a) Normal Hemostasis,<br>b) Bleeding time, Clotting time, Prothrombin time, Activated Partial Thromboplastin Time<br>c) Applied   | CO2, CO3   |
|   | <b>Unit 5</b>                | <b>Hematology-5</b>   |            |
|   |                              | a) <b>Blood bank introduction</b><br>b) <b>Blood grouping and Rh types</b><br>c) <b>Cross matching</b>  | CO2, CO3   |
|   |                              |   |            |
| 1 | <b>Course Code</b>           | <b>BCT224</b>   |            |
| 2 | <b>Course Title</b>          | <b>PATHOLOGY–II (LAB)</b>   |            |
| 3 | <b>Credits</b>               | <b>1</b>  |            |
| 4 | <b>Contact Hours (L-T-P)</b> | <b>0-0-2</b>  |            |
| 5 | Course Outcomes              | CO1: To understand the importance of histopathology techniques<br>CO2: To understand the importance of use of microscope<br>CO3: To understand the importance of clinicopathological techniques<br>CO4: To understand the importance of haematological investigations<br>CO5: To understand the importance of maintenance of blood bank |            |
| 6 | Course Description           | <ul style="list-style-type: none"> <li>• Histopathology</li> <li>• Clinical pathology</li> <li>• Hematology</li> </ul>  |            |
|   | <b>Practical's</b>           |   | CO mapping |

|  |  |  |     |     |          |
|--|--|--|-----|-----|----------|
|  | <b>Unit- 1</b>                         | a) Collection of blood samples – arterial<br>b) Collection of blood samples – venous<br>c) Safety procedure  |     |     | CO1      |
|  | <b>Unit-2</b>                          | a) Preparation of glassware<br>b) Use of glassware<br>c) Handling of instruments   |     |     | CO2      |
|  | <b>Unit-3</b>                          | a) Haemoglobin estimation<br>b) PCV estimation<br>c) ESR estimation  |     |     | CO2, CO3 |
|  | <b>Unit-4</b>                          | a) Blood grouping<br>b) Rh typing<br>c) Safety measures  |     |     | CO3, CO4 |
|  | <b>Unit 5</b>                          | a) Bleeding time estimation<br>b) Clotting time estimation<br>c) Prothrombin time and APTT estimation(understanding only)  |     |     | CO3, CO4 |
|  | Mode of examination                    | Theory and Practical   |     |     |          |
|  | Weightage Distribution for Theory      | CA   | MTE | ETE |          |
|  |  | 30%  | 20% | 50% |          |
|  | Weightage Distribution for Practical's | CA   | MTE | ETE |          |
|  |  | 60%  | 0%  | 40% |          |
|  | Text book/s*                           | 11. Culling Histopathology techniques<br>12. Bancroft Histopathology techniques<br>13. Koss – cytology<br>14. Winifred greg – Diagnostic cytopathology<br>15. Orell – Cyto Pathology<br>16. Todd & Sanford Clinical Diagnosis by laboratory method<br>17. Dacie & Lewis – Practical Haematology<br>18. Ramanic Sood, Laboratory Technology (Methods and interpretation) 4 <sup>th</sup> Ed.<br><br>J.P. Bros, New Delhi –1996)<br>19.Satish Gupta Short text book of Medical Laboratory for technician J.P. Bros, New Delhi – 1998<br>20. Sachdev K.N. Clinical Pathology and Bacteriology 8 <sup>th</sup> Ed, J.P. Bros |     |     |          |

|  |  |   |  |
|--|--|---|--|
|  |  | 12. Krishna - Text book of Pathology, Orient Longman PVT Ltd.<br>Bacteriology 8 <sup>th</sup> Ed, J.P. Bros, New Delhi-1991 |  |
|--|--|---|--|

|     |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 3 |

|     |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 |



**BCT 215: Microbiology II & BCT 225: Microbiology II (Lab)**

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|  |                          |   |  |
|--|--------------------------|---|--|
| <b>School: SAHS</b>                              |                          | <b>Batch : 2021-25</b>  |  |
| <b>Program: BCVT</b>                             |                          | <b>Current Academic Year: 2021-22</b>   |  |
| <b>Branch:<br/>Cardiovascular<br/>Technology</b> |                          | <b>Semester: 2</b>  |  |
| 1  | Course Code              | <b>BCT 215</b>  |  |
| 2  | Course Title             | <b>MICROBIOLOGY-I</b>   |  |
| 3  | Credits                  | <b>3</b>  |  |
| 4  | Contact Hours<br>(L-T-P) | <b>2-1-0</b>  |  |
|  | Course Status            | Compulsory  |  |
| 5  | Course Objective         | <p>6. Able to collect and dispatch specimen for routine investigation</p> <p>7. Able to interpret commonly done bacteriological and serological investigations</p> <p>8. Able to control hospital infections</p> <p>9. Able to manage biomedical waste management</p> <p>10. Able to understand immunisation schedule</p>   |  |
| 6  | Course Outcomes          | <p>CO1: To understand the techniques of specimen collection</p> <p>CO2: To understand the importance of bacteriological and serological investigations</p> <p>CO3: To understand the importance of nosocomial infection complication</p> <p>CO4: To understand the importance of biochemical waste management</p> <p>CO5: To understand the importance microscopy and their handling techniques and staining procedures</p> |  |
| 7  | Course Description       | <ul style="list-style-type: none"> <li>• Classification, growth and nutrition of microorganism</li> <li>• Sterilisation and disinfection</li> <li>• Immunology</li> <li>• Systemic bacteriology</li> </ul>  |  |

|   |                                |  |               |
|---|--------------------------------|--|---------------|
|   |                                | <ul style="list-style-type: none"> <li>• Parasitology</li> <li>• Mycology</li> <li>• Virology</li> <li>• Hospital infection</li> <li>• Biomedical waste management</li> </ul>  |               |
| 8 | <b>Outline syllabus Theory</b> |  | CO mapping    |
|   | <b>Unit 1</b>                  | <b>Systemic Bacteriology</b>   |               |
|   |                                | a) Morphology, cultivation, diseases caused ,laboratory diagnosis includingspecimen collection of the following bacteria( the classification, antigenicstructure and pathogenicity are not to be taught)<br>b) Staphylococci, Streptococci, Pneumococci, Gonococci, Meningococci,<br>c) C diphtheriae, Mycobacteria, Clostridia, Bacillus, Shigella, Salmonella, Esch coliKlebsiella, Proteus,vibrio cholerae, Pseudomonas & Spirochetes | CO1           |
|   | <b>Unit 2</b>                  | <b>Mycology</b>  |               |
|   |                                | a) Morphology, diseases caused and lab diagnosis of following fungi , Candida,<br>b) Cryptococcus, Dermatophytes ,<br>c) opportunistic fungi   | CO1, CO2      |
|   | <b>Unit 3</b>                  | <b>Virology</b>  |               |
|   |                                | a) General properties of viruses, diseases caused,<br>b) lab diagnosis and prevention of following viruses, Herpes, Hepatitis,<br>c) HIV, Rabies and Poliomyelitis   | CO1, CO2      |
|   | <b>Unit 4</b>                  | <b>Hospital infection</b>  |               |
|   |                                | a) Causative agents, transmission methods,<br>b) investigation<br>c) prevention and control Hospital infection   | CO1, CO2, CO3 |
|   | <b>Unit 5</b>                  | <b>Biomedical waste management</b>   |               |
|   |                                | a) Principle<br>b) Practice<br>c) Applied  | CO2, CO3      |
| 1 | <b>Course Code</b>             | <b>BCT225</b>  |               |

|   |                              |  |            |
|---|------------------------------|--|------------|
| 2 | <b>Course Title</b>          | <b>MICROBIOLOGY–II (LAB)</b>   |            |
| 3 | <b>Credits</b>               | <b>1</b>   |            |
| 4 | <b>Contact Hours (L-T-P)</b> | <b>0-0-2</b>   |            |
| 5 | Course Outcomes              | CO1: To understand the importance of compound microscopy<br>CO2: To understand the importance of sterilization<br>CO3: To understand the importance of serological tests<br>CO4: To understand the importance of gram staining<br>CO5: To understand the importance of biomedical waste management |            |
| 6 | Course Description           | <ul style="list-style-type: none"> <li>• Microscopy</li> <li>• Clinical pathology</li> <li>• Hematology</li> </ul>   |            |
|   | <b>Practical's</b>           |  | CO mapping |
|   | <b>Unit- 1</b>               | Stool examination for<br>a) Ova<br>b) Cyst<br>c) Parasite  | CO1        |
|   | <b>Unit-2</b>                | Lab diagnosis of<br>a) candida, Cryptococcus<br>b) dermatophytes<br>c) opportunistic fungi   | CO1,CO2    |
|   | <b>Unit-3</b>                | Lab diagnosis of<br>a) Herpes<br>b) Hepatitis, HIV, Rabies<br>c) Poliomyelitis   | CO2        |
|   | <b>Unit-4</b>                | a) Visit to hospital for demonstration of biomedical waste management-1<br>b) Visit to hospital for demonstration of biomedical waste management-2<br>c) Visit to hospital for demonstration of biomedical waste management-3  | CO2,CO3    |
|   | <b>Unit 5</b>                | a) Anaerobic culture methods-1<br>b) Anaerobic culture methods-2<br>c) Anaerobic culture methods-3   | CO3,CO4    |

|  |  |   |     |     |  |
|--|--|---|-----|-----|--|
|  | Mode of examination                    | Theory and Practical  |     |     |  |
|  | Weightage Distribution for Theory      | CA  | MTE | ETE |  |
|  |  | 30%   | 20% | 50% |  |
|  | Weightage Distribution for Practical's | CA  | MTE | ETE |  |
|  |  | 60%   | 0%  | 40% |  |
|  | Text book/s*                           | 9. Anathanarayana & Panikar Medical Microbiology<br>10. Roberty Cruckshank – Medical Microbiology – The Practice of Medical Microbiology<br>11. Chatterjee – Parasitology – Interpretation to Clinical medicine<br>12. Rippon – Medical Mycology<br>13. Emmons – Medical mycology<br>14. Basic laboratory methods in Parasitology, 1 <sup>st</sup> Ed, J P Bros, New Delhi<br>15. Basic laboratory procedures in clinical bacteriology, 1 <sup>st</sup> Ed, J P Brothers<br>16. Medical Parasitology – Ajit Damle |     |     |  |

|     |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 3 |

|     |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 |

### **BCT 216: Basics of Hospital and Data Management - II**

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|                      |                                       |  |
|----------------------|---------------------------------------|--|
| <b>School: SAHS</b>  | <b>Batch : 2021-25</b>                |  |
| <b>Program: BCVT</b> | <b>Current Academic Year: 2021-22</b> |  |
| <b>Branch:</b>       | <b>Semester: 2</b>                    |  |

SU/SAHS/BCVT

|                                  |                       |   |            |
|----------------------------------|-----------------------|---|------------|
| <b>Cardiovascular Technology</b> |                       |   |            |
| 1                                | Course Code           | <b>BCT 216</b>  |            |
| 2                                | Course Title          | <b>Basics of Hospital and Data Management</b>   |            |
| 3                                | Credits               | <b>3</b>  |            |
| 4                                | Contact Hours (L-T-P) | <b>2-1-0</b>  |            |
|                                  | Course Status         | Compulsory  |            |
| 5                                | Course Objective      | 6. Able to understand the techniques management and organizational behaviour<br>7. Able to understand the quality control and hospital information system<br>8. Able to understand the principle of CDM<br>9. Able to know data management<br>10. Able to manage material and inventory control, storage, equipment/operation .   |            |
| 6                                | Course Outcomes       | CO1: To understand the techniques management and organizational behaviour<br>CO2: To understand the importance of quality control and hospital information system<br>CO3: To understand the importance of CDM<br>CO4: To understand the importance of documents in data management and material management and inventory control<br>CO5: To understand the importance of storage techniques and equipments/operation management |            |
| 7                                | Course Description    | <ul style="list-style-type: none"> <li>• Introduction to Management</li> <li>• Organizational behaviour</li> <li>• Quality Control</li> <li>• Hospital Information System</li> <li>• Introduction and Principles of CDM</li> <li>• Documents in data Management</li> <li>• Material management and Inventory Control</li> <li>• Storage</li> <li>• Equipment/ Operations management</li> </ul>                                  |            |
| 8                                | Outline syllabus      |   | CO mapping |
|                                  | <b>Theory</b>         |   |            |
|                                  | <b>Unit 1</b>         | <b>Documents in data Management:</b>  |            |
|                                  |                       | a) Prescription, Case Report form, Source   | CO1        |

|                                   |   |   |     |
|-----------------------------------|---|---|-----|
|                                   |   | documents, Informed consent form, Patient information sheet,<br>b) Clinical study report,<br>c) Log books, Master files |     |
| <b>Unit 2</b>                     | <b>Material management and Inventory Control:</b>   |   |     |
|                                   | a) Concept, Materials Planning, Classification of Materials-Consumable and Non consumable, working out quantities required, forecasting,<br>b) Budgeting, various costs of inventory,<br>c) Inventory techniques-ABC, SDE / VED Analysis, EOQ models. | CO1   |     |
| <b>Unit 3</b>                     | <b>Storage:</b>   |   |     |
|                                   | a) Importance and functions of storage,<br>b) Location and layout of stores,<br>c) Management of receipts and issue of materials from stores, Warehousing costs, Stock verification   | CO2   |     |
| <b>Unit 4</b>                     | <b>Equipment/ Operations management:-1</b>  |   |     |
|                                   | a) hospital equipment repair and maintenance, types of maintenance,<br>b) job orders, equipment maintenance log books, AMCS,<br>c) outsourcing of maintenance services,   | CO2   |     |
| <b>Unit 5</b>                     | <b>Equipment/ Operations management:-2</b>  |   |     |
|                                   | a) quality and reliability,<br>b) concept of failure, equipment history and documents, replacement policy, calibration tests, spare parts,<br>c) stocking techniques and polices  | CO3   |     |
|                                   |   |   |     |
| Mode of examination               | Theory and Practical  |   |     |
| Weightage Distribution for Theory | CA  | MTE   | ETE |
|                                   | 30%   | 20%   | 50% |
| Weightage Distribution for        | CA  | MTE   | ETE |
|                                   | 60%   | 0%  | 40% |

|  |              |  |  |  |  |
|--|--------------|--|--|--|--|
|  | Practical's  |  |  |  |  |
|  | Text book/s* |  |  |  |  |

|     |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 3 |

### **BCT 311: Medicine Relevant to Cardiac care technology**

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|  |   |  |
|--|---|--|
| <b>School: SAHS</b>                              | <b>Batch : 2021-2025</b>  |  |
| <b>Program: BCT</b>                              | <b>Current Academic Year: 2022-2023</b>   |  |
| <b>Branch:<br/>Cardiovascular<br/>Technology</b> | <b>Semester: 3</b>  |  |
| 1 Course Code                                    | <b>BCT 311</b>  |  |
| 2 Course Title                                   | <b>Medicine Relevant to Cardiac care technology - I</b>   |  |
| 3 Credit Hours                                   | <b>4</b>  |  |
| 4 Contact Hours<br>(L-T-P)                       | <b>4-0-0</b>  |  |
| Course Status                                    | Compulsory  |  |
| 5 Course Objective                               | 1. Able to understand CVS disease<br>2. Able to understand concepts of Hematology<br>3. Able to understand concepts of Respiratory system<br>4. Able to understand concepts of Renal system & CNS<br>5. Able to understand problems of metabolic syndrome and age specified problem |  |
| 6 Course Outcomes                                | CO1: To understand the concepts of cardiovascular system<br>CO2: To understand the importance of Hematology<br>CO3: To understand the concepts of Respiratory sytem<br>CO4: To understand the concepts of CNS   |  |

|   |                                   |  |     |     |
|---|-----------------------------------|--|-----|-----|
|   |                                   | CO5: To understand the importance of metabolic syndrome and age specified problems   |     |     |
| 7 | Course Description                | <ul style="list-style-type: none"> <li>• Cardiovascular system</li> <li>• Hematology</li> <li>• Renal system</li> <li>• CNS</li> <li>• Respiratory system</li> <li>• DM,obesity, pregnancy, elderly, paediatric</li> </ul> |     |     |
| 8 | Outline syllabus                  |  |     |     |
|   | <b>Theory</b>                     |  |     |     |
|   | <b>Unit 1</b>                     | <b>Cardiovascular system-1</b>   |     |     |
|   |                                   | a) Ischemic Heart Disease- General, Angina pectoris<br>b) Ischemic Heart Disease- MI<br>c) Rheumatic heart disease   |     | CO1 |
|   | <b>Unit 2</b>                     | <b>Cardiovascular system-2</b>   |     |     |
|   |                                   | a) Congenital heart disease<br>b) Hypertension<br>c) Aortic Aneurysm   |     | CO1 |
|   | <b>Unit 3</b>                     | <b>Cardiovascular system-3</b>   |     |     |
|   |                                   | a) Cardiomyopathy<br>b) Peripheral vascular disease<br>c) Pulmonary edema and LV failure   |     | CO1 |
|   | <b>Unit 4</b>                     | <b>Hematology</b>  |     |     |
|   |                                   | a) Anaemia<br>b) Bleeding disorders<br>c) Laboratory tests used to diagnose bleeding disorders (in brief)  |     | CO2 |
|   | <b>Unit 5</b>                     | <b>Respiratory system</b>  |     |     |
|   |                                   | a) Respiratory system – General<br>b) Chronic obstructive airway diseases (COPD)<br>c) Concept of obstructive versus restrictive pulmonary disease PFT and its interpretation  |     | CO3 |
|   | Mode of examination               | Theory   |     |     |
|   | Weightage Distribution for Theory | CA   | MTE | ETE |
|   |                                   | 30%  | 20% | 50% |
|   | Weightage Distribution            | CA   | MTE | ETE |
|   |                                   |  |     |     |



|  |                   |  |  |  |  |
|--|-------------------|--|--|--|--|
|  | for<br>Practicals |  |  |  |  |
|  | Text<br>book/s*   | 1. Harrison principle of internal medicine<br>2. Davidson principle and practice of medicine |  |  |  |

| POs<br>Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1        | 2   | 3   | 1   | 3   | 2   | 1   | 2   | 2    | 2    | 3    |
| CO2        | 3   | 3   | 2   | 2   | 3   | 2   | 3   | 2    | 3    | 2    |
| CO3        | 2   | 3   | 2   | 3   | 3   | 3   | 3   | 2    | 3    | 3    |
| CO4        | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3    | 2    | 2    |
| CO5        | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2    | 2    | 2    |

**BCT 312: Applied Pathology - I & BCT 322: Applied Pathology - I(Lab)**

|  |                       |   |     |
|--|-----------------------|---|-----|
| <b>School: SAHS</b>                      |                       | <b>Batch : 2021-25</b>  |     |
| <b>Program: BCT</b>                      |                       | <b>Current Academic Year: 2022-2023</b>   |     |
| <b>Branch: Cardiovascular Technology</b> |                       | <b>Semester: 2</b>  |     |
| 1  | Course Code           | <b>BCT 312</b>  |     |
| 2  | Course Title          | <b>Applied Pathology - I</b>  |     |
| 3  | Credit Hours          | <b>4</b>  |     |
| 4  | Contact Hours (L-T-P) | <b>3-1-2</b>  |     |
|  | Course Status         | Compulsory  |     |
| 5  | Course Objective      | <ol style="list-style-type: none"> <li>1. Able to understand the progression of diseases related to various system of body.</li> <li>2. Able to identify, diagnose and describe the disease from specimen</li> <li>3. Able to identify, diagnose and describe the disease from certain blood tests.</li> <li>4. Able to understand basic pathological principle in course of diagnosis of disease</li> <li>5. Able to relate pathological diagnosis with disease progression</li> </ol> |     |
| 6  | Course Outcomes       | <p>CO1: To understand the importance of disease progression mechanism</p> <p>CO2: To understand the importance of techniques of specimen collection</p> <p>CO3: To understand the importance of techniques of performing certain blood tests</p> <p>CO4: To understand the importance of diagnosing diseases</p> <p>CO5: To understand the importance of interrelating disease progression with pathological change</p>   |     |
| 7  | Course Description    | <ul style="list-style-type: none"> <li>• Cardiovascular system</li> <li>• Hematology</li> <li>• Respiratory system</li> <li>• Renal system</li> </ul>   |     |
| 8  | Outline syllabus      |   |     |
|  | <b>Theory</b>         |   |     |
|  | <b>Unit 1</b>         | <b>Cardiovascular system-1</b>  |     |
|  |                       | a) Atherosclerosis- Definition, risk  | CO1 |

|   |                              |   |               |
|---|------------------------------|---|---------------|
|   |                              | <p>factors, briefly Pathogenesis &amp; morphology, clinical significance and prevention.</p> <p>b) Hypertension- Definition, types and briefly Pathogenesis and effects of Hypertension.</p> <p>c) Aneurysms – Definition, classification, Pathology and complications</p>    |               |
|   | <b>Unit 2</b>                | <b>Cardiovascular system-2</b>  |               |
|   |                              | <p>a) Pathophysiology of Heart failure.</p> <p>b) Cardiac hypertrophy – causes, Pathophysiology &amp; Progression to Heart Failure.</p> <p>c) Ischaemic heart diseases- Definition, Types. Briefly Pathophysiology, Pathology &amp; Complications of various types of IHD</p> | CO1, CO2      |
|   | <b>Unit 3</b>                | <b>Cardiovascular system-3</b>  |               |
|   |                              | <p>a) Valvular Heart diseases- causes, Pathology &amp; complication.</p> <p>b) Complications of artificial valves.</p> <p>c) Cardiomyopathy – Definition, Types, causes and significance</p>  | CO1, CO2, CO3 |
|   | <b>Unit 4</b>                | <b>Cardiovascular system-4</b>  |               |
|   |                              | <p>a) Pericardial effusion- causes, effects and diagnosis.</p> <p>b) Congenital heart diseases – Basic defect and</p> <p>c) effects of important types of congenital heart diseases.</p>  | CO2, CO3      |
|   | <b>Unit 5</b>                | <b>Hematology-1</b>   |               |
|   |                              | <p>a) Anaemia – Definition, morphological types and</p> <p>b) diagnosis of anaemia.</p> <p>c) Brief concept about Haemolytic anaemia and polycythaemia</p>  | CO3           |
| 1 | <b>Course Code</b>           | <b>BCT 322</b>  |               |
| 2 | <b>Course Title</b>          | <b>Applied pathology - I(LAB)</b>   |               |
| 3 | <b>Credit Hours</b>          | <b>1</b>  |               |
| 4 | <b>Contact Hours (L-T-P)</b> | <b>0-0-2</b>  |               |

|   |                     |  |          |
|---|---------------------|--|----------|
| 5 | Course Outcomes     | CO1: To understand the importance of diagnosing disease from gross specimen<br>CO2: To understand the importance of interpretation and diagnosis from haematological chart<br>CO3: To understand the importance estimation of hemoglobin<br>CO4: To understand the importance performing certain blood tests<br>CO5: To understand the importance of pathological maneuver in diagnosing the disease |          |
| 6 | Course Description  | <ul style="list-style-type: none"> <li>• Gross specimen – various disease</li> <li>• Diagnosis and interpretation by charts</li> <li>• Hematological tests</li> </ul>  |          |
|   | <b>Practicals</b>   |  |          |
|   | <b>Unit- 1</b>      | Atherosclerosis<br>a) Description<br>b) Diagnosis<br>c) Interpretation   | CO1      |
|   | <b>Unit-2</b>       | Aortic aneurysm<br>a) Description<br>b) Diagnosis<br>c) Interpretation   | CO1      |
|   | <b>Unit-3</b>       | Myocardial infarction<br>a) Description<br>b) Diagnosis<br>c) Interpretation   | CO2      |
|   | <b>Unit-4</b>       | Emphysema<br>a) Description<br>b) Diagnosis<br>c) Interpretation   | CO2      |
|   | <b>Unit 5</b>       | Chronic glomerulonephritis<br>a) Description<br>b) Diagnosis<br>c) Interpretation  | CO2, CO3 |
|   | Mode of examination | Theory and Practical   |          |

|  |                                       |  |     |     |  |
|--|---------------------------------------|--|-----|-----|--|
|  | Weightage Distribution for Theory     | CA   | MTE | ETE |  |
|  |                                       | 10%  |     | 40% |  |
|  | Weightage Distribution for Practicals | CA   | MTE | ETE |  |
|  |                                       | 10%  |     | 40% |  |
|  | Text book/s*                          | <ol style="list-style-type: none"> <li>1. Culling Histopathology techniques</li> <li>2. Bancroft Histopathology techniques</li> <li>3. Koss – cytology</li> <li>4. Winifred greg – Diagnostic cytopathology</li> <li>5. Orell – Cyto Pathology</li> <li>6. Todd &amp; Sanford Clinical Diagnosis by laboratory method</li> <li>7. Dacie &amp; Lewis – Practical Haematology</li> </ol> Ramanic Sood, Laboratory Technology |     |     |  |

| POs Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|---------|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1     | 2   | 3   | 1   | 3   | 2   | 1   | 2   | 2    | 2    | 3    |
| CO2     | 3   | 3   | 2   | 2   | 3   | 2   | 3   | 2    | 3    | 2    |
| CO3     | 2   | 3   | 2   | 3   | 3   | 3   | 3   | 2    | 3    | 3    |
| CO4     | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3    | 2    | 2    |
| CO5     | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2    | 2    | 2    |

### **BCT 313: Applied Microbiology - I & BCT 323: Applied Microbiology - I (Lab)**

|  |                       |  |  |
|--|-----------------------|--|--|
| <b>School: SAHS</b>                      |                       | <b>Batch : 2021-25</b>   |  |
| <b>Program: BCT</b>                      |                       | <b>Current Academic Year: 2022-2023</b>  |  |
| <b>Branch: Cardiovascular Technology</b> |                       | <b>Semester: 3</b>   |  |
| 1  | Course Code           | <b>BCT 313</b>   |  |
| 2  | Course Title          | <b>Applied Microbiology - I</b>  |  |
| 3  | Credit Hours          | <b>4</b>   |  |
| 4  | Contact Hours (L-T-P) | <b>2-1-2</b>   |  |
|  | Course Status         | Compulsory   |  |
| 5  | Course Objective      | <ol style="list-style-type: none"> <li>1. Able to understand health care associated infections, antimicrobial resistance,</li> <li>2. Able to understand health care associated disease</li> </ol> |  |

|   |                    |   |     |
|---|--------------------|---|-----|
|   |                    | <p>communicable to health care workers in hospital setup and its preventive measures.</p> <ol style="list-style-type: none"> <li>3. Perform microbiological surveillance and sampling.</li> <li>4. Able to understand the methodology of disinfection of instruments, patient care unit, ICU's, various methods of sterilization of room,</li> <li>5. Able to understand the methodology of disinfection equipments, central supply department, sterilization techniques</li> </ol> |     |
| 6 | Course Outcomes    | <p>CO1: To understand the importance of health care associated infection and antimicrobial resistance<br/> CO2: To understand the importance of disease communicable in hospitals and preventive measures<br/> CO3: To understand the importance of microbiological surveillance and sampling<br/> CO4: To understand the importance of diagnosing diseases<br/> CO5: To understand the importance of sterilization techniques</p>  |     |
| 7 | Course Description | <ul style="list-style-type: none"> <li>• Health care associated infections and Antimicrobial resistance</li> <li>• Disease communicable to Healthcare workers in hospital set up and its preventive measure</li> <li>• Microbiological surveillance and sampling</li> <li>• Sterilization and importance of sterilization</li> <li>• Preparation of materials for autoclaving</li> </ul>  |     |
| 8 | Outline syllabus   |   |     |
|   | <b>Theory</b>      |   |     |
|   | <b>Unit 1</b>      | Health care associated infections and Antimicrobial resistance-1  |     |
|   |                    | <p>Infections that patients acquire during the course of receiving treatment for other conditions within a healthcare setting like</p> <ol style="list-style-type: none"> <li>a) Methicillin Resistant Staphylococcus aureus infections,</li> <li>b) Infections caused by Clostridium difficile,</li> <li>c) Vancomycin resistant enterococci etc</li> </ol>  | CO1 |
|   | <b>Unit 2</b>      | Health care associated infections and Antimicrobial resistance-2  |     |
|   |                    | <ol style="list-style-type: none"> <li>a) Catheter related blood stream infections, Ventilator associated pneumonia, Catheter Related urinary tract infections,</li> <li>b) Surveillance of emerging resistance and changing flora.</li> <li>c) The impact and cost attributed to Hospital Associated</li> </ol>  | CO1 |

|   |                              |   |          |
|---|------------------------------|---|----------|
|   |                              | infection   |          |
|   | <b>Unit 3</b>                | Disease communicable to Healthcare workers in hospital set up and its preventive measure-1  |          |
|   |                              | Occupationally acquired infections in healthcare professionals by respiratory route<br>a) Tuberculosis,<br>b) Varicella-zoster,<br>c) Respiratory syncytial virus etc   | CO2      |
|   | <b>Unit 4</b>                | Disease communicable to Healthcare workers in hospital set up and its preventive measure-2  |          |
|   |                              | Occupationally acquired infections in healthcare professionals by respiratory route<br>a) Blood borne transmission ( HIV, Hepatitis B, Hepatitis C, Cytomegalovirus, Ebola virus etc),<br>b) Oro faecal route ( Salmonella, Hepatitis A etc),<br>c) Direct contact ( Herpes Simplex Virus etc).   | CO2, CO3 |
|   | <b>Unit 5</b>                | Disease communicable to Healthcare workers in hospital set up and its preventive measure-3  |          |
|   |                              | Preventive measures to combat the spread of these infections by<br>a) monitoring<br>b) control<br>c) Observation  | CO3      |
| 1 | <b>Course Code</b>           | <b>BCT 323</b>  |          |
| 2 | <b>Course Title</b>          | <b>Applied Microbiology - I(LAB)</b>  |          |
| 3 | <b>Credit Hours</b>          | <b>1</b>  |          |
| 4 | <b>Contact Hours (L-T-P)</b> | <b>0-0-2</b>  |          |
| 5 | Course Outcomes              | CO1: To understand the importance of autoclaving & quality control<br>CO2: To understand the importance of Collection of specimen<br>CO3: To understand the importance of sterility testing<br>CO4: To understand the importance performing disinfection<br>CO5: To understand the importance of Interpretation of results of sterility testing |          |
| 6 | Course Description           | 1. Principles of autoclaving & quality control of Sterilization.<br>2. Collection of specimen from outpatient units,  |          |

|  |                   |  |          |
|--|-------------------|--|----------|
|  |                   | <p>inpatient units, minor operation theater and major operation theater for sterility testing.</p> <p>3. The various methods employed for sterility testing.</p> <p>4. Interpretation of results of sterility testing.</p> <p>Disinfection of wards, OT and Laboratory</p> |          |
|  | <b>Practicals</b> |  |          |
|  | <b>Unit- 1</b>    | <p>Principle of autoclaving</p> <p>a) Methods</p> <p>b) Observations</p> <p>c) Precautions</p>   | CO1      |
|  | <b>Unit-2</b>     | <p>Quality control of sterilization</p> <p>a) Methods</p> <p>b) Observations</p> <p>c) Recautions</p>  | CO1      |
|  | <b>Unit-3</b>     | <p>Collection of specimen-1</p> <p>a) Methods</p> <p>b) Observations</p> <p>c) Precautions</p>   | CO2      |
|  | <b>Unit-4</b>     | <p>Collection of specimen-2</p> <p>a) Methods</p> <p>b) Observations</p> <p>c) Precautions</p>   | CO2      |
|  | <b>Unit 5</b>     | <p>The various methods employed for sterility testing</p> <p>a) Methods</p> <p>b) Observation</p> <p>c) Precautions</p>  | CO3      |
|  | Unit-6            | <p>Interpretation of result of sterility testing</p> <p>a) Interpretation</p> <p>b) Analysis</p> <p>c) Result</p>  | CO3      |
|  | Unit-7            | <p>Disinfection of wards</p> <p>a) Methods</p> <p>b) Observation</p> <p>c) Precaution</p>  | CO3, CO4 |



|  |                                       |  |     |     |     |
|--|---------------------------------------|--|-----|-----|-----|
|  |                                       |  |     |     |     |
|  | Unit-8                                | Disinfection of OT<br>d) Methods<br>e) Observation<br>f) Precaution  |     |     | CO4 |
|  | Unit-9                                | Disinfection of Laboratory<br>a) Methods<br>b) Observation<br>c) Precaution  |     |     | CO5 |
|  | Unit-10                               | Equipments<br>a) Observation<br>b) Maintenance<br>c) Sterilization   |     |     | CO5 |
|  | Mode of examination                   | Theory and Practical   |     |     |     |
|  | Weightage Distribution for Theory     | CA   | MTE | ETE |     |
|  |                                       | 10%  |     | 40% |     |
|  | Weightage Distribution for Practicals | CA   | MTE | ETE |     |
|  |                                       | 10%  |     | 40% |     |
|  | Text book/s*                          | <u>Microbiology</u><br>1. Anathanarayana & Panikar Medical Microbioloty<br>2. Roberty Cruckshank – Medical Microbiology – The Practice of Medical Mircrobiology<br>3. Chatterjee – Parasitology – Interpretation to Clinical medicine.<br>4. Rippon – Medical Mycology<br>5. Emmons – Medical mycology<br>6. Basic laboratory methods in Parasitology, 1 <sup>st</sup> Ed, J P Bros, New Delhi –<br>7. Basic laboratory procedures in clinical bacteriology, 1 <sup>st</sup> Ed, J P Brothers,<br>8. Medical Parasitology – Ajit Damle |     |     |     |

| POs<br>Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1        | 2   | 3   | 1   | 3   | 2   | 1   | 2   | 2    | 2    | 3    |
| CO2        | 3   | 3   | 2   | 2   | 3   | 2   | 3   | 2    | 3    | 2    |
| CO3        | 2   | 3   | 2   | 3   | 3   | 3   | 3   | 2    | 3    | 3    |
| CO4        | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3    | 2    | 2    |
| CO5        | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2    | 2    | 2    |

### BCT 314: Applied Pharmacology - I

|  |                       |  |  |
|--|-----------------------|--|--|
| <b>School: SAHS</b>                      |                       | <b>Batch : 2021-25</b>   |  |
| <b>Program: BCT</b>                      |                       | <b>Current Academic Year: 2021-2022</b>  |  |
| <b>Branch: Cardiovascular Technology</b> |                       | <b>Semester: 3</b>   |  |
| 1  | Course Code           | <b>BCT 314</b>   |  |
| 2  | Course Title          | <b>Applied Pharmacology - I</b>  |  |
| 3  | Credit Hours          | <b>3</b>   |  |
| 4  | Contact Hours (L-T-P) | <b>2-1-0</b>   |  |
|  | Course Status         | Compulsory   |  |
| 5  | Course Objective      | <ol style="list-style-type: none"> <li>1. Able to understand the basic scientific concepts and principles related to pharmacokinetics, pharmacodynamics,</li> <li>2. Able to understand the drug metabolism, drug-drug interaction, route of administration, drug action, drug efficacy and potency, drug toxicity etc.</li> <li>3. Able to know various drugs and their action related to different systems of body</li> <li>4. Able to perform certain experimental pharmacology procedure.</li> <li>5. Able to understand use of drugs in various diseases</li> </ol> |  |
| 6  | Course Outcomes       | CO1: To understand the concepts of pharmacological principles<br>CO2: To understand the mechanism of action of ANS drugs, CVS drugs, anaesthetic drugs<br>CO3: To understand the mechanism of action of analgesics, antihistaminic, antiemetics drugs<br>CO4: To understand the mechanism of action of CNS   |  |

|   |                                   |  |         |
|---|-----------------------------------|--|---------|
|   |                                   | stimulants,depressants, emergency drugs<br>CO5: To understand the mechanism of action of diuretics, cheomtherapy, corticosteroids  |         |
| 7 | Course Description                | <ul style="list-style-type: none"> <li>• Pharmacological principles</li> <li>• Autonomic nerves system</li> <li>• Cardiovascular drugs</li> <li>• Anaesthetic drugs</li> <li>• Analgesics drugs</li> <li>• Antihistamine and Antiemetics</li> <li>• CNS stimulants and depressants and inhalational gas and emergency drugs</li> <li>• Pharmacotherapy of respiratory disorders</li> <li>• Corticosteroids, Diuretics, Chemotherapy of infections</li> </ul> |         |
| 8 | Outline syllabus<br><b>Theory</b> |  |         |
|   | <b>Unit 1</b>                     | <b>Pharmacological principles</b>  |         |
|   |                                   | General concepts about<br>a) Pharmacodynamic and<br>b) Pharmacokinetic<br>c) Principles involved in drug activity  | CO1     |
|   | <b>Unit 2</b>                     | <b>Autonomic nerves system.</b>  |         |
|   |                                   | a) Anatomy & functional organisation.<br>b) List of drugs acting an ANS including dose, route of administration, indications,<br>c) contra indications and adverse effects   | CO2     |
|   | <b>Unit 3</b>                     | <b>Cardiovascular drugs</b>  |         |
|   |                                   | a) antihypertensives, antiarrhythmic, cardiac glycosides, sympathetic and nonsympathetic inotropic agents<br>b) coronary vasodilators, antianginal and antifailure agents, lipid lowering & antiatherosclerotic drugs<br>c) drugs used in hemostasis, cardioplegic drugs, primary solutions, drugs used in shock   | CO2,CO3 |
|   | <b>Unit 4</b>                     | <b>Anaesthetic drugs</b>   |         |
|   |                                   | a) Definition of general and local anaesthetics.,Classification of general anaesthetics.<br>b) Pharmacokinetics and Pharmacodynamics of inhaled anaesthetic agents.Intravenous general anaesthetic agents.<br>c) Local anaesthetics - classification mechanism of action, duration of action   | CO3     |

|  |                                       |   |     |     |     |
|--|---------------------------------------|---|-----|-----|-----|
|  |                                       | and methods to prolong the duration of action. Preparation, dose and routes of administration   |     |     |     |
|  | <b>Unit 5</b>                         | <b>Analgesics drugs</b>   |     |     |     |
|  |                                       | a) Definition and classification<br>b) Routes of administration, dose, frequency of administration,<br>c) Side effects and management of non opioid and opioid analgesics |     |     | CO3 |
|  | Mode of examination                   | Theory and Practical  |     |     |     |
|  | Weightage Distribution for Theory     | CA  | MTE | ETE |     |
|  |                                       | 20%   |     | 80% |     |
|  | Weightage Distribution for Practicals | CA  | MTE | ETE |     |
|  |                                       |   |     |     |     |

| POs<br>Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1        | 2   | 3   | 1   | 3   | 2   | 1   | 2   | 2    | 2    | 3    |
| CO2        | 3   | 3   | 2   | 2   | 3   | 2   | 3   | 2    | 3    | 2    |
| CO3        | 2   | 3   | 2   | 3   | 3   | 3   | 3   | 2    | 3    | 3    |
| CO4        | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3    | 2    | 2    |
| CO5        | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2    | 2    | 2    |

**BCT 314: INTRODUCTION TO CARDIAC CARE TECHNOLOGY&BCT 324:  
INTRODUCTION TO CARDIAC CARE TECHNOLOGY (LAB)**

|                                     |                        |  |
|-------------------------------------|------------------------|--|
| <b>School: SAHS</b><br>SU/SAHS/BCVT | <b>Batch : 2021-25</b> |  |
|-------------------------------------|------------------------|--|

|  |                       |   |  |
|--|-----------------------|---|--|
| <b>Program: BCVT</b>                     |                       | <b>Current Academic Year: 2022-2023</b>   |  |
| <b>Branch: Cardiovascular Technology</b> |                       | <b>Semester: 3</b>  |  |
| 1  | Course Code           | <b>BCT 314</b>  |  |
| 2  | Course Title          | Introduction to Cardiac Care Technology   |  |
| 3  | Credit Credits        | <b>5</b>  |  |
| 4  | Contact Hours (L-T-P) | <b>3-1-2</b>  |  |
|  | Course Status         | Compulsory  |  |
| 5  | Course Objective      | <ul style="list-style-type: none"> <li>• To enables students to become a trained, qualified cardiovascular technician capable of working independently or in association with a higher setup.</li> <li>• To integrate knowledge and skills of cardiovascular technology to provide health care solutions for the benefit of the society.</li> <li>• After the completion of program ,graduate become well-prepared for work associated with assisting cardiac surgeon's in tertiary care hospitals and others.</li> <li>• After the completion of program, candidates become well known in techniques such as Electrocardiography, Echocardiography, Treadmill Test/Stress test, Doppler Ultrasonography and contrast Echo.</li> <li>• Graduates will have a good leadership qualities and entrepreneur skills by working and communicating effectively in interdisciplinary environment, either independently or with a team.</li> </ul> |  |
| 6  | Course Outcomes       | <p>CO1: To apply knowledge of human cardiovascular and it's related system in the diagnosis, cardiovascular disorder &amp; it's management.</p> <p>CO2: To plan and implement clinical &amp; scientific activities related the profession of cardiovascular technology.</p> <p>CO3: To tackle future challenges through lifelong learning &amp; training process related to cardiac health.</p> <p>CO4: To diagnose and solve complex problems arising during cardiovascular care of the patients.</p> <p>CO5: To utilize modern tools and techniques in the field of cardiovascular technology for patient compliance.</p>   |  |
| 7  | Course Description    | <ul style="list-style-type: none"> <li>• Introduction of Electrocardiography.</li> </ul>  |  |

|   |                                   |   |                     |
|---|-----------------------------------|---|---------------------|
|   |                                   | <ul style="list-style-type: none"> <li>• Introduction of Echocardiography.</li> <li>• Safety measurements during Echocardiography procedures &amp; Limitation.</li> <li>• Patient preparation during Electrocardiography, Echocardiography, Treadmill Test.</li> <li>• Introduction of different types of Pacemaker.</li> <li>• Introduction of (Valvular Heart Disease, Coronary Artery Disease, &amp; Congestive Heart Disease.</li> <li>• Carbohydrate Chemistry</li> <li>• Lipid Chemistry</li> </ul> |                     |
| 8 | Outline syllabus<br><b>Theory</b> |   |                     |
|   | <b>Unit 1</b>                     | <b><u>ECG Basic Principles.</u></b>   |                     |
|   |                                   | <u>Theory:</u><br>a) Electrocardiography & its paper.<br>b) Basic Ecg and deflections & its ecg basic action.<br>c) The leads: Standard Limb, Precardial Lead, 'V' lead & 'AV' lead Basic ECG Deflections .   | CO1                 |
|   | <b>Unit 2</b>                     | <b><u>Normal EG The 'p' wave.</u></b>   |                     |
|   |                                   | a) The genesis of 'qrs' complex, T wave, the ST segment, The 'U' wave.<br>b) Rate & Rhythm.<br>c) Morphology of 'P' wave, qrs complex, & T wave.  | CO1,<br>CO2         |
|   | <b>Unit 3</b>                     | <b><u>Electric Axis.</u></b>  |                     |
|   |                                   | a) Precardial Pattern of ECG.<br>b) So called rotation of the heart -The QT interval.<br>c) The Electric Field.   | CO2,<br>CO3         |
|   | <b>Unit 4</b>                     | <b><u>Chamber Enlargement.</u></b>  |                     |
|   |                                   | a) Atrial enlargement, LV Hypertrophy, RV Hypertrophy.<br>b) Principles of Bundle Branch B locks, LBBB, RBBB.<br>c) The Hemiblocks.   | CO2,<br>CO3,<br>CO4 |
|   | <b>Unit 5</b>                     | <b><u>Exercise Stress Testing.</u></b>  |                     |
|   |                                   | a) Exercise & its protocols.<br>b) Electrocardiography Measurements.<br>c) Exercise Testing-Indications & Techniques.   | CO1,<br>CO2,<br>CO3 |
| 1 | <b>Course Code</b>                | <b>BCT324</b>   |                     |

|                   |                              |   |                     |
|-------------------|------------------------------|---|---------------------|
| 2                 | <b>Course Title</b>          | <b>INTRODUCTION TO CARDIAC CARE TECHNOLOGY (LAB)</b>  |                     |
| 3                 | <b>Credit Hours</b>          | <b>1</b>  |                     |
| 4                 | <b>Contact Hours (L-T-P)</b> | <b>0-0-2</b>  |                     |
| 5                 | Course Outcomes              | CO1: To understand the importance of Electrocardiography.<br>CO2: To understand the importance of Echocardiography.<br>CO3: To understand the importance of Treadmill Test.<br>CO4: To understand the importance of different types of Stress Test.<br>CO5: To understand the importance of different types of Pacemaker, |                     |
| 6                 | Course Description           | <ul style="list-style-type: none"> <li>• Introduction of ECG.</li> <li>• Introduction of Echocardiography.</li> <li>• Introduction of Treadmill Test &amp; Safety Precautions.</li> <li>• Introduction of Pacemaker &amp; its uses.</li> <li>• Introduction of Pulse Oximeter &amp; its uses.</li> </ul>                  |                     |
| <b>Practicals</b> |                              |   |                     |
|                   | <b>Unit 1</b>                | <u>Practical:</u><br>a) Examine the cardiovascular System.<br>b) Explain the different types of machines used to diagnose cardiovascular disease.<br>c) Explain about the coronary artery disease.  | CO1                 |
|                   | <b>Unit 2</b>                | a) Explain about the procedure of ECG.<br>b) Explain the different types of leads and electrodes present in ECG Device.<br>c) Explain about the Einthoven's triangle.   | CO1,<br>CO2         |
|                   | <b>Unit 3</b>                | a) To study the Epicardial pacing technique.<br>b) To study the working of pulse oximeter.<br>c) To study about coronary heart disease.   | CO2,<br>CO3         |
|                   | <b>Unit 4</b>                | a) Explain the pretest preparation of a patient for Echocardiography.<br>b) To demonstrate the Indication's & Contra-indication's of an Echocardiography.<br>c) Explain the different kind's of acoustic window's in Echocardiography.  | CO1,<br>CO2,<br>CO3 |

|                                       |   |      |     |             |
|---------------------------------------|---|------|-----|-------------|
| <b>Unit 5</b>                         | a) To demonstrate the different types of delivery routes in echocardiography<br>b) Explain the procedure to do an Echocardiography with a neat labelled diagram.<br>c) Explain about the different kind's of of view's in Echocardiography. |      |     | CO3,<br>CO4 |
| Mode of examination                   | Theory and Practical  |      |     |             |
| Weightage Distribution for Theory     | CA  | MTE  | ETE |             |
|                                       | 30%   | 20%  | 50% |             |
| Weightage Distribution for Practicals | CA  | MTE  | ETE |             |
|                                       | 60%   | ---- | 40% |             |
| Text book/s*                          |   |      |     |             |

| POs<br>Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1        | 2   | 3   | 1   | 3   | 2   | 1   | 2   | 2    | 2    | 3    |
| CO2        | 3   | 3   | 2   | 2   | 3   | 2   | 3   | 2    | 3    | 2    |
| CO3        | 2   | 3   | 2   | 3   | 3   | 3   | 3   | 2    | 3    | 3    |
| CO4        | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3    | 2    | 2    |
| CO5        | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2    | 2    | 2    |

### **BCT 411: Medicine Relevant To Cardiac Care Technology - II**

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|                                   |   |  |
|-----------------------------------|---|--|
| <b>School: SAHS</b>               | <b>Batch : 2021-2025</b>                |  |
| <b>Program: BCT</b>               | <b>Current Academic Year: 2022-2023</b> |  |
| <b>Branch:<br/>Cardiovascular</b> | <b>Semester: 4</b>                      |  |

SU/SAHS/BCVT



| <b>Technology</b> |                       |  |         |
|-------------------|-----------------------|--|---------|
| 1                 | Course Code           | <b>BCT 411</b>   |         |
| 2                 | Course Title          | <b>Medicine Relevant to Cardiac Care Technology - II</b>   |         |
| 3                 | Credit Hours          | <b>4</b>   |         |
| 4                 | Contact Hours (L-T-P) | <b>4-0-0</b>   |         |
|                   | Course Status         | Compulsory   |         |
| 5                 | Course Objective      | 6. Able to understand CVS disease<br>7. Able to understand concepts of Hematology<br>8. Able to understand concepts of Respiratory system<br>9. Able to understand concepts of Renal system & CNS<br>10. Able to understand problems of metabolic syndrome and age specified problem                 |         |
| 6                 | Course Outcomes       | CO1: To understand the concepts of cardiovascular system<br>CO2: To understand the importance of Hematology<br>CO3: To understand the concepts of Respiratory system<br>CO4: To understand the concepts of CNS<br>CO5: To understand the importance of metabolic syndrome and age specified problems |         |
| 7                 | Course Description    | <ul style="list-style-type: none"> <li>• Cardiovascular system</li> <li>• Hematology</li> <li>• Renal system</li> <li>• CNS</li> <li>• Respiratory system</li> <li>• DM,obesity, pregnancy, elderly, paediatric</li> </ul>   |         |
| 8                 | Outline syllabus      |  |         |
|                   | <b>Theory</b>         |  |         |
|                   | <b>Unit-1</b>         | <b>Renal system</b>  |         |
|                   |                       | a) ARF & CRF<br>b) End stage renal disease<br>c) Role of dialysis and renal transplantation in its management  | CO<br>3 |
|                   | <b>Unit-2</b>         | <b>Central Nervous System</b>  |         |
|                   |                       | a) Autonomic nervous system<br>-Sympathetic<br>b) ANS-<br>Parasympathetic system<br>c) Brief mention of CNS disorders & their etiology   | CO<br>4 |

|                                       |  |     |         |
|---------------------------------------|--|-----|---------|
|                                       |  |     |         |
| <b>Unit-3</b>                         | <b>Others-1</b>  |     |         |
|                                       | a) Diabetes mellitus-Type1&2<br>b) Other<br>c) Obesity   |     |         |
|                                       |  |     | CO<br>5 |
| <b>Unit-4</b>                         | <b>Others-2</b>  |     |         |
|                                       | a) Pregnancy-physiological variation<br>b) Pregnancy-nutritional requirements<br>c) Pregnancy-complication |     |         |
|                                       |  |     | CO<br>5 |
| <b>Unit-5</b>                         | <b>Others-3</b>  |     |         |
|                                       | a) Paediatric patient-Neonate<br>b) Paediatric patient-Infant<br>c) Elderly patient                        |     |         |
|                                       |  |     | CO<br>5 |
| Mode of examination                   | Theory   |     |         |
| Weightage Distribution for Theory     | CA   | MTE | ETE     |
|                                       | 30%  | 20% | 50%     |
| Weightage Distribution for Practicals | CA   | MTE | ETE     |
|                                       |  |     |         |
| Text book/s*                          | 3. Harrison principle of internal medicine<br>4. Davidson principle and practice of medicine               |     |         |

| POs<br>Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1        | 2   | 3   | 1   | 3   | 2   | 1   | 2   | 2    | 2    | 3    |
| CO2        | 3   | 3   | 2   | 2   | 3   | 2   | 3   | 2    | 3    | 2    |

|     |   |   |   |   |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|---|---|---|---|
| CO3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 |
| CO5 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

## BCT 412: Applied Pathology - II&BCT 422: Applied Pathology - II(Lab)

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|  |                       |   |  |
|--|-----------------------|---|--|
| <b>School: SAHS</b>                      |                       | <b>Batch : 2021-25</b>  |  |
| <b>Program: BCT</b>                      |                       | <b>Current Academic Year: 2022-2023</b>   |  |
| <b>Branch: Cardiovascular Technology</b> |                       | <b>Semester: 4</b>  |  |
| 1  | Course Code           | <b>BCT 412</b>  |  |
| 2  | Course Title          | <b>Applied Pathology - II</b>   |  |
| 3  | Credit Hours          | <b>4</b>  |  |
| 4  | Contact Hours (L-T-P) | <b>3-1-2</b>  |  |
|  | Course Status         | Compulsory  |  |
| 5  | Course Objective      | <p>6. Able to understand the progression of diseases related to various system of body.</p> <p>7. Able to identify, diagnose and describe the disease from specimen</p> <p>8. Able to identify, diagnose and describe the disease from certain blood tests.</p> <p>9. Able to understand basic pathological principle in course of diagnosis of disease</p> <p>10. Able to relate pathological diagnosis with disease progression</p> |  |
| 6  | Course Outcomes       | <p>CO1: To understand the importance of disease progression mechanism</p> <p>CO2: To understand the importance of techniques of specimen collection</p> <p>CO3: To understand the importance of techniques of performing certain blood tests</p> <p>CO4: To understand the importance of diagnosing diseases</p> <p>CO5: To understand the importance of interrelating disease progression with pathological change</p>               |  |
| 7  | Course Description    | <ul style="list-style-type: none"> <li>• Cardiovascular system</li> <li>• Hematology</li> <li>• Respiratory system</li> <li>• Renal system</li> </ul>   |  |
| 8  | Outline syllabus      |   |  |
|  | <b>Theory</b>         |   |  |
|  | <b>Unit-1</b>         | <b>Hematology-2</b>   |  |

|   |                    |   |     |
|---|--------------------|---|-----|
|   |                    | <ul style="list-style-type: none"> <li>a) Leukocyte disorders- Briefly leukaemia,leukocytosis, agranulocytosis etc.,</li> <li>b) Bleeding disorders- Definition, classification, causes &amp; effects of important types of bleeding disorders.</li> <li>c) Briefly various laboratory tests used to diagnose bleeding disorders</li> </ul> | CO3 |
|   | <b>Unit-2</b>      | <b>Respiratory system-1</b>   |     |
|   |                    | <ul style="list-style-type: none"> <li>a) Chronic obstructive airway diseases - Definition and types.</li> <li>b) Briefly causes, Pathology and complications of each type of COPD.</li> <li>c) Briefly concept about obstructive versus restrictive pulmonary disease</li> </ul>   | CO4 |
|   | <b>Unit-3</b>      | <b>Respiratory system-2</b>   |     |
|   |                    | <ul style="list-style-type: none"> <li>a) Pneumoconiosis- Definition, types, Pathology and effects in brief.</li> <li>b) Pulmonary congestion and edema.</li> <li>c) Pleural effusion - causes, effects and diagnosis.</li> </ul>   | CO4 |
|   | <b>Unit-4</b>      | <b>Renal system-1</b>   |     |
|   |                    | <ul style="list-style-type: none"> <li>a) Clinical manifestations of renal diseases.</li> <li>b) Briefly causes, mechanism, effects and laboratory diagnosis of ARF &amp; CRS.</li> <li>c) Briefly Glomerulonephritis and Pyelonephritis</li> </ul>   | CO5 |
|   | <b>Unit-5</b>      | <b>Renal system-2</b>   |     |
|   |                    | <ul style="list-style-type: none"> <li>a) End stage renal disease - Definition, causes, effects and</li> <li>b) role of dialysis and renal transplantation in its management</li> <li>c) Brief concept about obstructive uropathy.</li> </ul>   | CO5 |
| 1 | <b>Course Code</b> | <b>BCT 422</b>  |     |

|   |                              |  |          |
|---|------------------------------|--|----------|
| 2 | <b>Course Title</b>          | <b>Applied pathology - II(LAB)</b>   |          |
| 3 | <b>Credit Hours</b>          | <b>1</b>   |          |
| 4 | <b>Contact Hours (L-T-P)</b> | <b>0-0-2</b>   |          |
| 5 | Course Outcomes              | CO1: To understand the importance of diagnosing disease from gross specimen<br>CO2: To understand the importance of interpretation and diagnosis from haematological chart<br>CO3: To understand the importance estimation of hemoglobin<br>CO4: To understand the importance performing certain blood tests<br>CO5: To understand the importance of pathological maneuver in diagnosing the disease |          |
| 6 | Course Description           | <ul style="list-style-type: none"> <li>• Gross specimen – various disease</li> <li>• Diagnosis and interpretation by charts</li> <li>• Hematological tests</li> </ul>  |          |
|   | <b>Practicals</b>            |  |          |
|   | Unit-1                       | Chronic pyelonephritis<br>a) Description<br>b) Diagnosis<br>c) Interpretation  | CO3      |
|   | Unit-2                       | Interpretation & diagnosis of<br>a) Haematological chart – AML, CML,<br>b) Haematological chart -Hemophilia<br>c) Haematological chart- neutrophilia, eosinophilia   | CO3, CO4 |
|   | Unit-3                       | Interpretation & diagnosis of<br>a) Urine chart – ARF<br>b) Urine chart – CRF<br>c) Urine chart – Acute glomerulonephritis   | CO4      |
|   | Unit-4                       | Estimation of haemoglobin<br>a) Methods<br>b) Errors<br>c) Precautions   | CO4, CO5 |
|   | Unit-5                       | Estimation of  | CO5      |

|  |                                       |  |     |     |  |
|--|---------------------------------------|--|-----|-----|--|
|  |                                       | a) Bleeding time<br>b) Clotting time<br>c) Clinical relation   |     |     |  |
|  | Mode of examination                   | Theory and Practical   |     |     |  |
|  | Weightage Distribution for Theory     | CA   | MTE | ETE |  |
|  |                                       | 10%  |     | 40% |  |
|  | Weightage Distribution for Practicals | CA   | MTE | ETE |  |
|  |                                       | 10%  |     | 40% |  |
|  | Text book/s*                          | 8. Culling Histopathology techniques<br>9. Bancroft Histopathology techniques<br>10. Koss – cytology<br>11. Winifred greg – Diagnostic cytopathology<br>12. Orell – Cyto Pathology<br>13. Todd & Sanford Clinical Diagnosis by laboratory method<br>14. Dacie & Lewis – Practical Haematology<br>Ramanic Sood, Laboratory Technology |     |     |  |

| POs<br>Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1        | 2   | 3   | 1   | 3   | 2   | 1   | 2   | 2    | 2    | 3    |
| CO2        | 3   | 3   | 2   | 2   | 3   | 2   | 3   | 2    | 3    | 2    |
| CO3        | 2   | 3   | 2   | 3   | 3   | 3   | 3   | 2    | 3    | 3    |
| CO4        | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3    | 2    | 2    |
| CO5        | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2    | 2    | 2    |

### **BCT 413: Applied Microbiology - II&BCT 423: Applied Microbiology - II(Lab)**

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|  |              |   |  |
|--|--------------|---|--|
| <b>School: SAHS</b>                      |              | <b>Batch : 2021-25</b>                  |  |
| <b>Program: BCT</b>                      |              | <b>Current Academic Year: 2022-2023</b> |  |
| <b>Branch: Cardiovascular Technology</b> |              | <b>Semester: 4</b>                      |  |
| 1  | Course Code  | <b>BCT 413</b>                          |  |
| 2  | Course Title | <b>Applied Microbiology - II</b>        |  |
| 3  | Credit Hours | <b>4</b>                                |  |

|   |                          |   |     |
|---|--------------------------|---|-----|
| 4 | Contact Hours<br>(L-T-P) | 2-1-2   |     |
|   | Course Status            | Compulsory  |     |
| 5 | Course Objective         | <ol style="list-style-type: none"> <li>6. Able to understand health care associated infections, antimicrobial resistance,</li> <li>7. Able to understand health care associated disease communicable to health care workers in hospital setup and its preventive measures.</li> <li>8. Perform microbiological surveillance and sampling.</li> <li>9. Able to understand the methodology of disinfection of instruments, patient care unit, ICU's, various methods of sterilization of room,</li> <li>10. Able to understand the methodology of disinfection equipments, central supply department, sterilization techniques</li> </ol> |     |
| 6 | Course Outcomes          | <p>CO1: To understand the importance of health care associated infection and antimicrobial resistance</p> <p>CO2: To understand the importance of disease communicable in hospitals and preventive measures</p> <p>CO3: To understand the importance of microbiological surveillance and sampling</p> <p>CO4: To understand the importance of diagnosing diseases</p> <p>CO5: To understand the importance of sterilization techniques</p>  |     |
| 7 | Course Description       | <ul style="list-style-type: none"> <li>• Health care associated infections and Antimicrobial resistance</li> <li>• Disease communicable to Healthcare workers in hospital set up and its preventive measure</li> <li>• Microbiological surveillance and sampling</li> <li>• Sterilization and importance of sterilization</li> <li>• Preparation of materials for autoclaving</li> </ul>  |     |
| 8 | Outline syllabus         |   |     |
|   | <b>Theory</b>            |   |     |
|   | <b>Unit-1</b>            | Microbiological surveillance and sampling-1   |     |
|   |                          | <p>Required to determine the frequency of potential bacterial pathogens including</p> <ol style="list-style-type: none"> <li>a) Streptococcus pneumoniae,</li> <li>b) Haemophilus influenzae, and Moraxella catarrhalis and</li> <li>c) Also to assess the</li> </ol>   | CO3 |



|   |                              |  |         |
|---|------------------------------|--|---------|
|   |                              | antimicrobial resistance   |         |
|   | <b>Unit-2</b>                | Microbiological surveillance and sampling-2  |         |
|   |                              | Sampling:<br>a) rinse technique,<br>b) direct surface agar plating technique.<br>c) other  | CO4     |
|   | <b>Unit-3</b>                | Importance of sterilization:   |         |
|   |                              | a. Disinfection of instruments used in patient care: Classification, different methods, advantages and disadvantages of the various methods<br>b. Disinfection of the patient care unit<br>c. Infection control measures for ICU's   | CO4,CO5 |
|   | <b>Unit-4</b>                | Sterilization  |         |
|   |                              | a) Rooms: Gaseous sterilization, one atmosphere uniform glow discharge plasma (OAUGDP)<br>b) Equipments: classification of the instruments and appropriate methods of sterilization<br>c) Central supply department: the four areas and the floor plan for instrumentCleaning, high-level disinfecting and sterilizing areas | CO5     |
|   | <b>Unit-5</b>                | Preparation of materials for autoclaving   |         |
|   |                              | a) Packing of different types of materials,<br>b) loading,<br>c) holding time and unloading.   | CO5     |
| 1 | <b>Course Code</b>           | <b>BCT 423</b>   |         |
| 2 | <b>Course Title</b>          | <b>Applied Microbiology - II(LAB)</b>  |         |
| 3 | <b>Credit Hours</b>          | <b>1</b>   |         |
| 4 | <b>Contact Hours (L-T-P)</b> | <b>0-0-2</b>   |         |
| 5 | <b>Course Outcomes</b>       | CO1: To understand the importance of autoclaving & quality control<br>CO2: To understand the importance of Collection of specimen  |         |

|   |                            |  |            |
|---|----------------------------|--|------------|
|   |                            | CO3: To understand the importance of sterility testing<br>CO4: To understand the importance performing disinfection<br>CO5: To understand the importance of Interpretation of results of sterility testing   |            |
| 6 | Course Description         | 5. Principles of autoclaving & quality control of Sterilization.<br>6. Collection of specimen from outpatient units, inpatient units, minor operation theater and major operation theater for sterility testing.<br>7. The various methods employed for sterility testing.<br>8. Interpretation of results of sterility testing.<br>Disinfection of wards, OT and Laboratory |            |
|   | <b>Practicals</b>          |  |            |
|   | Unit-1                     | Interpretation of result of sterility testing<br>d) Interpretation<br>e) Analysis<br>f) Result   | CO3        |
|   | Unit-2                     | Disinfection of wards<br>g) Methods<br>h) Observation<br>i) Precaution   | CO3, CO4   |
|   | Unit-3                     | Disinfection of OT<br>j) Methods<br>k) Observation<br>l) Precaution  | CO4        |
|   | Unit-4                     | Disinfection of Laboratory<br>d) Methods<br>e) Observation<br>f) Precaution  | CO5        |
|   | Unit-5                     | Equipments<br>d) Observation<br>e) Maintenance<br>f) Sterilization   | CO5        |
|   | Mode of examination        | Theory and Practical   |            |
|   | Weightage Distribution for | CA<br>30%  | MTE<br>20% |
|   |                            |  | ETE<br>50% |

|  |                                       |   |     |            |
|--|---------------------------------------|---|-----|------------|
|  | Theory                                |   |     |            |
|  | Weightage Distribution for Practicals | CA<br>60%   | MTE | ETE<br>40% |
|  | Text book/s*                          | <u>Microbiology</u><br>7. Anathanarayana & Panikar Medical Microbioloty<br><br>8. Roberty Cruckshank – Medical Microbiology – The Practice of Medical Mircrobiology<br><br>9. Chatterjee – Parasitology – Interpretation to Clinical medicine.<br>10. Rippon – Medical Mycology<br>11. Emmons – Medical mycology<br>12. Basic laboratory methods in Parasitology, 1 <sup>st</sup> Ed, J P Bros, New Delhi –<br><br>8. Basic laboratory procedures in clinical bacteriology, 1 <sup>st</sup> Ed, J P Brothers,<br>8. Medical Parasitology – Ajit Damle |     |            |

| POs<br>Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1        | 2   | 3   | 1   | 3   | 2   | 1   | 2   | 2    | 2    | 3    |
| CO2        | 3   | 3   | 2   | 2   | 3   | 2   | 3   | 2    | 3    | 2    |
| CO3        | 2   | 3   | 2   | 3   | 3   | 3   | 3   | 2    | 3    | 3    |
| CO4        | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3    | 2    | 2    |
| CO5        | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2    | 2    | 2    |

### BCT 414: Applied Pharmacology - II

|  |   |  |
|--|---|--|
| <b>School: SAHS</b>                      | <b>Batch : 2021-25</b>                  |  |
| <b>Program: BCT</b>                      | <b>Current Academic Year: 2022-2023</b> |  |
| <b>Branch: Cardiovascular Technology</b> | <b>Semester: 4</b>                      |  |
| 1   Course Code                          | <b>BCT 414</b>                          |  |

|   |                          |  |     |
|---|--------------------------|--|-----|
| 2 | Course Title             | <b>Applied Pharmacology - II</b>   |     |
| 3 | Credit Hours             | <b>3</b>   |     |
| 4 | Contact Hours<br>(L-T-P) | <b>2-1-0</b>   |     |
|   | Course Status            | Compulsory   |     |
| 5 | Course Objective         | <p>6. Able to understand the basic scientific concepts and principles related to pharmacokinetics, pharmacodynamics,</p> <p>7. Able to understand the drug metabolism, drug-drug interaction, route of administration, drug action, drug efficacy and potency, drug toxicity etc.</p> <p>8. Able to know various drugs and their action related to different systems of body</p> <p>9. Able to perform certain experimental pharmacology procedure.</p> <p>10. Able to understand use of drugs in various diseases</p> |     |
| 6 | Course Outcomes          | <p>CO1: To understand the concepts of paharmacological principles</p> <p>CO2: To understand the mechanism of action of ANS drugs, CVS drugs, anaesthetic drugs</p> <p>CO3: To understand the mechanism of action of analgesics, antihistaminic, antiemetics drugs</p> <p>CO4: To understand the mechanism of action of CNS stimulants,depressants, emergency drugs</p> <p>CO5: To understand the mechanism of action of diuretics, cheomtherapy, corticosteroids</p>   |     |
| 7 | Course Description       | <ul style="list-style-type: none"> <li>• Pharmacological principles</li> <li>• Autonomic nerves system</li> <li>• Cardiovascular drugs</li> <li>• Anaesthetic drugs</li> <li>• Analgesics drugs</li> <li>• Antihistamine and Antiemetics</li> <li>• CNS stimulants and depressants and inhalational gas and emergency drugs</li> <li>• Pharmacotherapy of respiratory disorders</li> <li>• Corticosteroids, Diuretics, Chemotherapy of infections</li> </ul>   |     |
| 8 | Outline syllabus         |  |     |
|   | <b>Theory</b>            |  |     |
|   | <b>Unit-1</b>            | <b>Antihistamine and Antiemetics</b>   |     |
|   |                          | <p>a) Classification, Mechanism of action,</p> <p>b) adverse effects,</p> <p>c) Preparations, dose and routes and administration</p>   | CO3 |

|  |               |  |     |
|--|---------------|--|-----|
|  | <b>Unit-2</b> | <b>CNS stimulants and depressants and inhalational gas and emergency drugs</b>   |     |
|  |               | a) alcohol, Sedatives, hypnotics and narcotics,CNS stimulants,neuromuscular blocking agents and muscle relaxants<br>b) pharmacological protection of organs during CPB<br>c) inhalational gaes and emergency drugs   | CO4 |
|  | <b>Unit-3</b> | <b>Pharmacotherapy of respiratory disorders</b>  |     |
|  |               | a) Introduction – Modulators of bronchial smooth muscle tone and pulmonary vascular smooth muscle tone<br>b) Pharmacotherapy of bronchial asthma<br>Pharmacotherapy of cough<br>Mucokinetic and mucolytic agents<br>c) Use of bland aerosols in respiratory care.  | CO4 |
|  | <b>Unit-4</b> | <b>Corticosteroids, Diuretics, Chemotherapy of infections</b>  |     |
|  |               | a) Corticosteroids-Classification, mechanism of action, adverse effects and complications.<br>Preparation, dose and routes of administration<br>b) Diuretics <ul style="list-style-type: none"> <li>• Renal physiology</li> <li>• Side of action of diuretics</li> <li>• Adverse effects</li> <li>• Preparations, dose and routes of administrion</li> </ul> c) Chemotherapy of infections <ul style="list-style-type: none"> <li>• Definition</li> <li>• Classification and mechanism of action of antimicrobial agents</li> <li>• Combination of antimicrobial agents</li> <li>• Chemoperophylaxis.</li> <li>• Classification, spectrum of activity, dose, routes of administration and adverse effects of penicillin, cephalosporins, aminoglycosides, tetracyclines, chloramphenicol, antitubercular drugs.</li> </ul> | CO5 |
|  | <b>Unit-5</b> | <b>Miscellaneous</b>   |     |
|  |               | a) IV fluids- various preparations and their usage.Electrolyte supplements   | CO5 |

|  |                                       |  |     |     |  |
|--|---------------------------------------|--|-----|-----|--|
|  |                                       | b) Immunosuppressive agents<br>New drugs included in perfusion technology. |     |     |  |
|  |                                       | c) Drugs used in metabolic and electrolyte imbalance                       |     |     |  |
|  | Mode of examination                   | Theory and Practical   |     |     |  |
|  | Weightage Distribution for Theory     | CA   | MTE | ETE |  |
|  |                                       | 30%  | 20% | 50% |  |
|  | Weightage Distribution for Practicals | CA   | MTE | ETE |  |
|  |                                       | 60%  |     | 40% |  |

| POs<br>Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1        | 2   | 3   | 1   | 3   | 2   | 1   | 2   | 2    | 2    | 3    |
| CO2        | 3   | 3   | 2   | 2   | 3   | 2   | 3   | 2    | 3    | 2    |
| CO3        | 2   | 3   | 2   | 3   | 3   | 3   | 3   | 2    | 3    | 3    |
| CO4        | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3    | 2    | 2    |
| CO5        | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2    | 2    | 2    |

**BCT 415: INTRODUCTION TO CARDIAC CARE TECHNOLOGY– II&BCT 425:  
INTRODUCTION TO CARDIAC CARE TECHNOLOGY (LAB)**

|  |   |  |
|--|---|--|
| <b>School: SAHS</b>                              | <b>Batch : 2021-25</b>                  |  |
| <b>Program: BCVT</b>                             | <b>Current Academic Year: 2022-2023</b> |  |
| <b>Branch:<br/>Cardiovascular<br/>Technology</b> | <b>Semester: 4</b>                      |  |

|   |                       |   |  |
|---|-----------------------|---|--|
| 1 | Course Code           | <b>BCT 415</b>  |  |
| 2 | Course Title          | Introduction to Cardiac Care Technology - II  |  |
| 3 | Credit Credits        | <b>5</b>  |  |
| 4 | Contact Hours (L-T-P) | <b>3-1-2</b>  |  |
|   | Course Status         | Compulsory  |  |
| 5 | Course Objective      | <ul style="list-style-type: none"> <li>• To enables students to become a trained, qualified cardiovascular technician capable of working independently or in association with a higher setup.</li> <li>• To integrate knowledge and skills of cardiovascular technology to provide health care solutions for the benefit of the society.</li> <li>• After the completion of program ,graduate become well-prepared for work associated with assisting cardiac surgeon's in tertiary care hospitals and others.</li> <li>• After the completion of program, candidates become well known in techniques such as Electrocardiography, Echocardiography, Treadmill Test/Stress test, Doppler Ultrasonography and contrast Echo.</li> <li>• Graduates will have a good leadership qualities and entrepreneur skills by working and communicating effectively in interdisciplinary environment, either independently or with a team.</li> </ul> |  |
| 6 | Course Outcomes       | <p>CO1: To apply knowledge of human cardiovascular and it's related system in the diagnosis, cardiovascular disorder &amp; it's management.</p> <p>CO2: To plan and implement clinical &amp; scientific activities related the profession of cardiovascular technology.</p> <p>CO3: To tackle future challenges through lifelong learning &amp; training process related to cardiac health.</p> <p>CO4: To diagnose and solve complex problems arising during cardiovascular care of the patients.</p> <p>CO5: To utilize modern tools and techniques in the field of cardiovascular technology for patient compliance.</p>   |  |
| 7 | Course Description    | <ul style="list-style-type: none"> <li>• Introduction of Electrocardiography.</li> <li>• Introduction of Echocardiography.</li> <li>• Safety measurements during Echocardiography procedures &amp; Limitation.</li> </ul>   |  |

|   |                                   |  |                             |
|---|-----------------------------------|--|-----------------------------|
|   |                                   | <ul style="list-style-type: none"> <li>• Patient preparation during Electrocardiography, Echocardiography, Treadmill Test.</li> <li>• Introduction of different types of Pacemaker.</li> <li>• Introduction of (Valvular Heart Disease, Coronary Artery Disease, &amp; Congestive Heart Disease.</li> <li>• Carbohydrate Chemistry</li> <li>• Lipid Chemistry</li> </ul>   |                             |
| 8 | Outline syllabus<br><b>Theory</b> |  |                             |
|   | <b>Unit 1</b>                     | <b><u>Echocardiography</u></b>   |                             |
|   |                                   | a) Basic Principles of Echocardiography.<br>b) Modalities of Echo ( M- mode, 2D, Color Doppler).<br>c) Transoesophageal Echocardiography.  | CO1<br>,<br>CO2<br>,<br>CO3 |
|   | <b>Unit 2</b>                     | <b><u>Instrumentations.</u></b>  |                             |
|   |                                   | a) Basic pulse echo system & Transducer.<br>b) Pulse generation & Echo Detection.<br>c) Modalities, Display & Record.  | CO2<br>,<br>CO3<br>,<br>CO4 |
|   | <b>Unit 3</b>                     | Echocardiographic Examination.   |                             |
|   |                                   | a) Selecting Transducer's, Position of the patient, Placement of the Transducer.<br>b) Setting Control (M -mode Labelling, 2D Echo, Normal Variants, Terminology.<br>c) Identification of Segments.  | CO3<br>,<br>CO4             |
|   | <b>Unit 4</b>                     | <b><u>Doppler Echocardiography</u></b>   |                             |
|   |                                   | a) Introduction to Doppler Color Echocardiography the Doppler principles, Doppler ultrasound techniques, Color Doppler flow Imaging, Clinical application of Doppler Echocardiograph.<br>b) Physical principles & Instrumentation in Spectral & Color Doppler flow imaging, Physical principles & Doppler effect, The Doppler Echocardiography system. Blood Flow Pattern (Laminar & Non Laminar).<br>c) Doppler Echo Modes (Continuous Doppler System, Pulsed Doppler | CO4<br>,<br>CO5             |



|   |                              |   |                     |
|---|------------------------------|---|---------------------|
|   |                              | System, High pulse repetition frequency).   |                     |
|   | <b>Unit 5</b>                | <b><u>Contrast Echocardiography</u></b>   |                     |
|   |                              | a) Echo measurements-' ASE ' recommendation.<br>b) Types of dye's used.<br>c) Nephrotoxic effect of dye used in contrast echo.  | CO4,<br>CO5         |
|   |                              |   |                     |
| 1 | <b>Course Code</b>           | <b>BCT425</b>   |                     |
| 2 | <b>Course Title</b>          | <b>INTRODUCTION TO CARDIAC CARE TECHNOLOGY - II(LAB)</b>  |                     |
| 3 | <b>Credit Hours</b>          | <b>1</b>  |                     |
| 4 | <b>Contact Hours (L-T-P)</b> | <b>0-0-2</b>  |                     |
| 5 | <b>Course Outcomes</b>       | CO1: To understand the importance of Electrocardiography.<br>CO2: To understand the importance of Echocardiography.<br>CO3: To understand the importance of Treadmill Test.<br>CO4: To understand the importance of different types of Stress Test.<br>CO5: To understand the importance of different types of Pacemaker, |                     |
| 6 | <b>Course Description</b>    | <ul style="list-style-type: none"> <li>• Introduction of ECG.</li> <li>• Introduction of Echocardiography.</li> <li>• Introduction of Treadmill Test &amp; Safety Precautions.</li> <li>• Introduction of Pacemaker &amp; its uses.</li> <li>• Introduction of Pulse Oximeter &amp; its uses.</li> </ul>                  |                     |
|   | <b>Practical's</b>           |   |                     |
|   | <b>Unit 1</b>                | a) Explain the procedure of Stress Echocardiography.<br>b) Examine the different types of pharmacological drugs used during Stress Echocardiography.<br>c) Explain the advantages and disadvantages of Stress Echocardiography.   | CO1,<br>CO2,<br>CO3 |
|   | <b>Unit 2</b>                | a) Explain the procedure of Transoesophageal Echocardiography.<br>b) Explain about the working of Pacemaker.<br>c) Explain about the Artificial Pacemaker.  | CO2,<br>CO3,<br>CO4 |

|                                       |   |     |     |                     |
|---------------------------------------|---|-----|-----|---------------------|
| <b>Unit 3</b>                         | a) Demonstrate the procedure of Treadmill Test.<br>b) To study about Indication's & Contra-indication's of treadmill.<br>c) Explain about the procedure of Stress TMT.  |     |     | CO3,<br>CO4         |
| <b>Unit 4</b>                         | a) To Demonstrate the Bruce Protocol used in Treadmill Test.<br>b) Explain about the types of Stress Testing along with indication's & contra-indication's.<br>c) To Determine a study of Valvular Heart Disease. |     |     | CO3,<br>CO4,<br>CO5 |
| <b>Unit 5</b>                         | a) Explain about the types of Hypertension & the medication's used during Hypertension.<br>b) Explain the different types of routes to administer drug's.<br>c) Explain about Cardiac arrest & it's management.   |     |     | CO4,<br>CO5         |
| Mode of examination                   | Theory and Practical  |     |     |                     |
| Weightage Distribution for Theory     | CA  | MTE | ETE |                     |
|                                       | 30%   | 20% | 50% |                     |
| Weightage Distribution for Practicals | CA  | MTE | ETE |                     |
|                                       | 60%   |     | 40% |                     |
| Text book/s*                          |   |     |     |                     |

| POs<br>Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1        | 2   | 3   | 1   | 3   | 2   | 1   | 2   | 2    | 2    | 3    |
| CO2        | 3   | 3   | 2   | 2   | 3   | 2   | 3   | 2    | 3    | 2    |
| CO3        | 2   | 3   | 2   | 3   | 3   | 3   | 3   | 2    | 3    | 3    |
| CO4        | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3    | 2    | 2    |
| CO5        | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2    | 2    | 2    |

**BCT 511: Cardiac Care Technology- Clinical - I & BCT 521: Cardiac Care Technology - Clinical- I (Lab)**

|  |   |  |
|--|---|--|
| <b>School: SAHS</b>                      | <b>Batch : 2021-25</b>  |  |
| <b>Program: BCVT</b>                     | <b>Current Academic Year: 2023-2024</b>   |  |
| <b>Branch: Cardiovascular Technology</b> | <b>Semester: 5</b>  |  |
| 1 Course Code                            | <b>BCT 511</b>  |  |
| 2 Course Title                           | Cardiac Care Technology – clinical – I  |  |
| 3 Credit Hours                           | <b>8</b>  |  |
| 4 Contact Hours (L-T-P)                  | <b>4-2-4</b>  |  |
| Course Status                            | Compulsory  |  |
| 5 Course Objective                       | <ul style="list-style-type: none"> <li>• To trained the students in the understanding of cardiac disease development</li> <li>• To make the students able to do routine investigation to identify various cardiac disease</li> <li>• To prepare students for provind assistance to cardiologist</li> <li>• To provide the conceptual basis for understanding of various maneuver for diagnosis and interpretation of cardiac disease</li> <li>• To develop diagnostic skills in cardiovascular technology</li> </ul>  |  |
| 6 Course Outcomes                        | <ol style="list-style-type: none"> <li>1. Graduates will be able to understand normal ECG, basic abnormalities of ECG in various disease,</li> <li>2. Graduates will be able to understand findings of ECHO in various diseases</li> <li>3. Graduates will be able to know equipment details, handling and radiation hazards of cardiac catheterization lab.</li> <li>4. Graduates will be able to know materials used in cath. lab and their sterilization technique</li> <li>5. Graduates will be able to know different aspects of coronary angiography and peripheral angiogram.</li> </ol> |  |
| 7 Course                                 | <ul style="list-style-type: none"> <li>• <b>Interpretation of Normal ECG and Basic</b></li> </ul>   |  |

|   |                                   |  |                 |
|---|-----------------------------------|--|-----------------|
|   | Description                       | <p><b>abnormalities of ECG in RHD, IHD &amp; CHD</b></p> <ul style="list-style-type: none"> <li>• <b>Echo in RHD,CHD,IHD, pericardial disease and other CVD</b></li> <li>• <b>Assessment of cardiac function</b></li> <li>• <b>Cardiac catheterization and coronary angiogram</b></li> </ul> |                 |
| 8 | Outline syllabus<br><b>Theory</b> |  |                 |
|   | <b>Unit 1</b>                     | <b>Interpretation of Normal ECG and Basic abnormalities of ECG in RHD, IHD &amp; CHD</b>   |                 |
|   |                                   | <ul style="list-style-type: none"> <li>a) Normal ECG</li> <li>b) Abnormalities</li> <li>c) Interpretation</li> </ul>   | CO1             |
|   | <b>Unit 2</b>                     | <b>Echo in rheumatic heart disease</b>   |                 |
|   |                                   | <ul style="list-style-type: none"> <li>a) Echo in mitral stenosis, mitral incompetence,</li> <li>b) aortic stenosis, aorticincompetence, pulmonary hypertension.</li> <li>c) Post AVR, post MVR. Prosthetic valve malfunction, LA clot.</li> </ul>   | CO2             |
|   | <b>Unit 3</b>                     | <b>Echo in congenital heart disease</b>  |                 |
|   |                                   | <ul style="list-style-type: none"> <li>a) Echo in ASD, VSD, PDA,</li> <li>b) pulmonary stenosis, aortic stenosis,</li> <li>c) coarctation of aorta, TOF. dextrocardia.</li> </ul>  | CO2             |
|   | <b>Unit 4</b>                     | <b>Echo in ischemic heart disease</b>  |                 |
|   |                                   | <ul style="list-style-type: none"> <li>a) Echo in acute myocardial infarction, old myocardial infarction and</li> <li>b) other ischemic heart disease related conditions,</li> <li>c) LV aneurysm</li> </ul>   | CO2, CO3        |
|   | <b>Unit 5</b>                     | <b>Echo in other cardiovascular disease</b>  |                 |
|   |                                   | <ul style="list-style-type: none"> <li>a) Echo in various types of cardio myopathy infective endocardities diseases of aorta,</li> <li>b) Mitral valve prolapse,</li> <li>c) Myxoma and other cardio vascular diseases.</li> </ul>   | <b>CO2, CO3</b> |
|   | <b>Unit 6</b>                     | <b>Assessment of Cardiac function</b>  |                 |
|   |                                   | <ul style="list-style-type: none"> <li>a) Measurements of all cardiac chambers</li> <li>b) Assessment of cardiac function</li> <li>c) Abnormalities</li> </ul>   | <b>CO2,CO3</b>  |

|   |                              |   |                |
|---|------------------------------|---|----------------|
|   | <b>Unit 7</b>                | <b>Echo in pericardial disease</b>  |                |
|   |                              | a) Pericardial effusion,<br>b) Cardiac tamponade,<br>c) Constrictive pericarditis   | <b>CO2,CO3</b> |
| 1 | <b>Course Code</b>           | <b>BCT 521</b>  |                |
| 2 | <b>Course Title</b>          | <b>Cardiac Care Technology-Clinical- I (LAB)</b>  |                |
| 3 | <b>Credit Hours</b>          | <b>2</b>  |                |
| 4 | <b>Contact Hours (L-T-P)</b> | <b>0-0-4</b>  |                |
| 5 | Course Outcomes              | <ol style="list-style-type: none"> <li>1. Graduates will be able to understand normal ECG, basic abnormalities of ECG in various disease,</li> <li>2. Graduates will be able to understand findings of ECHO in various diseases</li> <li>3. Graduates will be able to know equipment details, handling and radiation hazards of cardiac catheterization lab.</li> <li>4. Graduates will be able to know materials used in cath. lab and their sterilization technique</li> <li>5. Graduates will be able to know different aspects of coronary angiography and peripheral angiogram.</li> </ol> |                |
| 6 | Course Description           | <ul style="list-style-type: none"> <li>• <b>Interpretation of Normal ECG and Basic abnormalities of ECG in RHD, IHD &amp; CHD</b></li> <li>• <b>Echo in RHD,CHD,IHD, pericardial disease and other CVD</b></li> <li>• <b>Assessment of cardiac function</b></li> <li>• <b>Cardiac catheterization and coronary angiogram</b></li> </ul>   |                |
|   | <b>Practicals</b>            |   |                |
|   | <b>Unit 1</b>                | a) Normal ECG<br>b) Abnormalities<br>c) Interpretation  | <b>CO1</b>     |

|  |                                       |   |     |     |     |
|--|---------------------------------------|---|-----|-----|-----|
|  | <b>Unit 2</b>                         | a) Echo in mitral stenosis, mitral incompetence,<br>b) Echo in aortic stenosis, aortic incompetence, pulmonary hypertension.<br>c) Echo in Post AVR, post MVR. Prosthetic valve malfunction, LA clot. |     |     | CO2 |
|  | <b>Unit 3</b>                         | a) Echo in ASD, VSD, PDA,<br>b) pulmonary stenosis, aortic stenosis,<br>c) coarctation of aorta, TOF. Dextrocardia  |     |     | CO2 |
|  | <b>Unit 4</b>                         | a) Echo in acute myocardial infarction, old myocardial infarction and<br>b) other ischemic heart disease related conditions,<br>c) LV aneurysm  |     |     | CO2 |
|  | <b>Unit 5</b>                         | a) Echo in various types of cardio myopathy infective endocarditis diseases of aorta,<br>b) Mitral valve prolapse,<br>c) Myxoma and other cardio vascular disease                                     |     |     | CO2 |
|  | <b>Unit 6</b>                         | a) Measurements of all cardiac chambers<br>b) Assessment of cardiac function<br>c) Abnormalities  |     |     | CO3 |
|  |                                       |   |     |     |     |
|  | Mode of examination                   | Theory and Practical  |     |     |     |
|  | Weightage Distribution for Theory     | CA  | MTE | ETE |     |
|  |                                       |   |     |     |     |
|  | Weightage Distribution for Practicals | CA  | MTE | ETE |     |
|  |                                       |   |     |     |     |
|  | Text book/s*                          |   |     |     |     |

|            |     |     |     |     |     |     |     |      |      |      |
|------------|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| POs<br>Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
| CO1        | 2   | 3   | 1   | 3   | 2   | 1   | 2   | 2    | 2    | 3    |

|     |   |   |   |   |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|---|---|---|---|
| CO2 | 3 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 2 |
| CO3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 |
| CO5 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

**BCT 512: Cardiac Care Technology- Applied – I & BCT 522: Cardiac Care Technology**

**Applied-I (Lab)**

|  |                       |  |  |
|--|-----------------------|--|--|
| <b>School: SAHS</b>                      |                       | <b>Batch : 2021-25</b>   |  |
| <b>Program: BCVT</b>                     |                       | <b>Current Academic Year: 2023-2024</b>  |  |
| <b>Branch: Cardiovascular Technology</b> |                       | <b>Semester: 5</b>   |  |
| 1  | Course Code           | <b>BCT 512</b>   |  |
| 2  | Course Title          | Cardiac Care Technology Applied- I   |  |
| 3  | Credit Hours          | <b>8</b>   |  |
| 4  | Contact Hours (L-T-P) | <b>4-2-4</b>   |  |
|  | Course Status         | Compulsory   |  |
| 5  | Course Objective      | <ul style="list-style-type: none"> <li>• To trained the students in the understanding of cardiac disease development</li> <li>• To make the students able to do routine investigation to identify various cardiac disease</li> <li>• To prepare students for provide assistance to cardiologist</li> <li>• To provide the conceptual basis for understanding of various maneuver for diagnosis and interpretation of cardiac disease</li> <li>• To develop diagnostic skills in cardiovascular technology</li> </ul> |  |
| 6  | Course Outcomes       | <ol style="list-style-type: none"> <li>1. Graduates will be able to understand normal ECG, basic abnormalities of ECG in various disease,</li> <li>2. Graduates will be able to understand findings of ECHO in various diseases</li> <li>3. Graduates will be able to know equipment details, handling and radiation hazards of cardiac catheterization lab.</li> <li>4. Graduates will be able to know</li> </ol>   |  |

|   |                    |   |            |
|---|--------------------|---|------------|
|   |                    | <p>materials used in cath. lab and their sterilization technique</p> <p>5. Graduates will be able to know different aspects of coronary angiography and peripheral angiogram.</p>   |            |
| 7 | Course Description | <ul style="list-style-type: none"> <li>• <b>Interpretation of Normal ECG and Basic abnormalities of ECG in RHD, IHD &amp; CHD</b></li> <li>• <b>Echo in RHD,CHD,IHD, pericardial disease and other CVD</b></li> <li>• <b>Assessment of cardiac function</b></li> <li>• <b>Cardiac catheterization and coronary angiogram</b></li> </ul> |            |
| 8 | Outline syllabus   |   |            |
|   | <b>Theory</b>      |   |            |
|   | <b>Unit 1</b>      | <b>ECG in myocardial infarction</b>   |            |
|   |                    | <p>a) Definition of myocardial infarction, Diagnosis of myocardial infarction,</p> <p>b) ECG criteria for myocardial infarction,</p> <p>c) ECG in anterior wall, inferior wall, True posterior wall and sub endocardial infarction and RV infarction</p>  | CO1        |
|   | <b>Unit 2</b>      | <b>ECG in rheumatic heart disease</b>   |            |
|   |                    | <p>a) Definition of rheumatic heart disease,</p> <p>b) Valvular involvement in rheumatic heart disease,</p> <p>c) ECG in mitral stenosis, mitral incompetence, aortic stenosis and aortic incompetence</p>  | CO1        |
|   | <b>Unit 3</b>      | <b>ECG in hypertension</b>  | <b>CO1</b> |
|   |                    | <p>a) Definition of hypertension,</p> <p>b) How to record blood pressure,</p> <p>c) ECG in hypertension</p>   |            |
|   | <b>Unit 4</b>      | <b>ECG in congenital heart disease</b>  |            |
|   |                    | <p>a) Common congenital heart disease ASD, VSD, PDA,</p> <p>b) pulmonary stenosis aortic stenosis, coarctation of aorta,</p> <p>c) TOF, definition of all these conditions , ECG changes in all these conditions</p>  | CO1        |
|   | <b>Unit 5</b>      | <b>ECG in other conditions</b>  |            |
|   |                    |   | <b>CO1</b> |



|   |                              |   |            |
|---|------------------------------|---|------------|
|   |                              | <p>a) ECG in various types of cardiomyopathy, myxoedema,<br/> b) pericardial effusion, acute pericardities and other vascular diseases.<br/> c) Bundle branch block, WPW syndrome, dextrocardia</p>   |            |
|   | <b>Unit 6</b>                | <b>Trans esophageal echocardiogram</b>  |            |
|   |                              | <p>a) Indications, Procedure,<br/> b) Usefulness,<br/> c) Complications one may encounter and its management</p>  | <b>CO2</b> |
|   | <b>Unit 7</b>                | <b>Stress Echo</b>  |            |
|   |                              | <p>a) procedure<br/> b) indications<br/> c) Precautions</p>   | <b>CO2</b> |
| 1 | <b>Course Code</b>           | <b>BCT 522</b>  |            |
| 2 | <b>Course Title</b>          | <b>Cardiac Care Technology-Applied(LAB)</b>   |            |
| 3 | <b>Credit Hours</b>          | <b>2</b>  |            |
| 4 | <b>Contact Hours (L-T-P)</b> | <b>0-0-4</b>  |            |
| 5 | <b>Course Outcomes</b>       | <p>1.Graduates will be able to understand normal ECG, basic abnormalities of ECG in various disease,</p> <p>2.Graduates will be able to understand findings of ECHO in various diseases</p> <p>3.Graduates will be able to know equipment details, handling and radiation hazards of cardiac catheterization lab.</p> <p>4.Graduates will be able to know materials used in cath. lab and their sterilization technique</p> <p>5.Graduates will be able to know different aspects of coronary angiography and peripheral angiogram.</p> |            |
| 6 | <b>Course Description</b>    | <ul style="list-style-type: none"> <li>● <b>Interpretation of Normal ECG and Basic abnormalities of ECG in RHD, IHD &amp; CHD</b></li> <li>● <b>Echo in RHD,CHD,IHD, pericardial disease and other CVD</b></li> <li>● <b>Assessment of cardiac function</b></li> </ul>  |            |

|  |                                       |   |             |
|--|---------------------------------------|---|-------------|
|  |                                       |   |             |
|  | <b>Practicals</b>                     |   |             |
|  | <b>Unit 1</b>                         | d) Normal ECG<br>e) Abnormalities<br>f) Interpretation  | CO1         |
|  | <b>Unit 2</b>                         | d) Echo in mitral stenosis, mitral incompetence,<br>e) Echo in aortic stenosis, aortic incompetence, pulmonary hypertension.<br>f) Echo in Post AVR, post MVR. Prosthetic valve malfunction, LA clot. | CO2         |
|  | <b>Unit 3</b>                         | d) Echo in ASD, VSD, PDA,<br>e) pulmonary stenosis, aortic stenosis,<br>f) coarctation of aorta, TOF. Dextrocardia  | CO2         |
|  | <b>Unit 4</b>                         | d) Echo in acute myocardial infarction, old myocardial infarction and<br>e) other ischemic heart disease related conditions,<br>f) LV aneurysm  | CO2         |
|  | <b>Unit 5</b>                         | d) Echo in various types of cardio myopathy infective endocardities diseases of aorta,<br>e) Mitral valve prolapse,<br>f) Myxoma and other cardio vascular disease                                    | CO2         |
|  | <b>Unit 6</b>                         | d) Measurements of all cardiac chambers<br>e) Assessment of cardiac function<br>f) Abnormalities  | CO3,<br>CO4 |
|  |                                       |   |             |
|  | Mode of examination                   | Theory and Practical  |             |
|  | Weightage Distribution for Theory     | CA  | MTE         |
|  |                                       |   | ETE         |
|  | Weightage Distribution for Practicals | CA  | MTE         |
|  |                                       |   | ETE         |

|  |              |  |  |
|--|--------------|--|--|
|  | Text book/s* |  |  |
|--|--------------|--|--|

| POs<br>Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1        | 2   | 3   | 1   | 3   | 2   | 1   | 2   | 2    | 2    | 3    |
| CO2        | 3   | 3   | 2   | 2   | 3   | 2   | 3   | 2    | 3    | 2    |
| CO3        | 2   | 3   | 2   | 3   | 3   | 3   | 3   | 2    | 3    | 3    |
| CO4        | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3    | 2    | 2    |
| CO5        | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2    | 2    | 2    |

**BCT 513: Cardiac Care Technology- Advanced - & BCT 523: Cardiac Care Technology  
Advanced- (Lab)**

|  |  |  |
|--|--|--|
| <b>School: SAHS</b>                              | <b>Batch : 2021-25</b>   |  |
| <b>Program: BCVT</b>                             | <b>Current Academic Year: 2022-23</b>  |  |
| <b>Branch:<br/>Cardiovascular<br/>Technology</b> | <b>Semester: 5</b>   |  |
| 1 Course Code                                    | <b>BCT 513</b>   |  |
| 2 Course Title                                   | Cardiac Care Technology – Advanced - I   |  |
| 3 Credit Hours                                   | <b>8</b>   |  |
| 4 Contact Hours<br>(L-T-P)                       | <b>4-2-4</b>   |  |
| Course Status                                    | Compulsory   |  |
| 5 Course<br>Objective                            | <ul style="list-style-type: none"> <li>• To trained the students in the understanding of cardiac disease development</li> <li>• To make the students able to do routine investigation to identify various cardiac disease</li> <li>• To prepare students for provide assistance to cardiologist</li> <li>• To provide the conceptual basis for understanding of various</li> </ul> |  |

|   |                    |  |     |
|---|--------------------|--|-----|
|   |                    | <p>maneuver for diagnosis and interpretation of cardiac disease</p> <ul style="list-style-type: none"> <li>To develop diagnostic skills in cardiovascular technology</li> </ul>  |     |
| 6 | Course Outcomes    | <ol style="list-style-type: none"> <li>Graduates will be able to understand normal ECG, basic abnormalities of ECG in various disease,</li> <li>Graduates will be able to understand findings of ECHO in various diseases</li> <li>Graduates will be able to know equipment details, handling and radiation hazards of cardiac catheterization lab.</li> <li>Graduates will be able to know materials used in cath. lab and their sterilization technique</li> <li>Graduates will be able to know different aspects of coronary angiography and peripheral angiogram.</li> </ol> |     |
| 7 | Course Description | <ul style="list-style-type: none"> <li><b>Cardiac monitoring</b></li> <li><b>Interpretation of TMT</b></li> <li><b>Use of defibrillator</b></li> <li><b>Management of cardiac arrest</b></li> <li><b>Myocardial perfusion scan</b></li> <li><b>Cardiac arrhythmias</b></li> <li><b>Electrolyte disturbances</b></li> <li><b>Holter monitoring</b></li> <li><b>Valvoplasties</b></li> <li><b>Coil closure and device closure of PDA</b></li> <li><b>Device closure of ASD,VSD</b></li> <li><b>Pressure recording, pacing, pregnancy, nuclear cardiology</b></li> </ul>            |     |
| 8 | Outline syllabus   |  |     |
|   | <b>Theory</b>      |  |     |
|   | <b>Unit 1</b>      | <b>Cardiac monitoring</b>  |     |
|   |                    | <ol style="list-style-type: none"> <li>Definition,</li> <li>Purpose of cardiac monitoring,</li> <li>How to Recognise various arrhythmias</li> </ol> <p>How to set up a intensive coronary care unit and usefulness of ICCU</p>   | CO1 |
|   | <b>Unit 2</b>      | <b>Interpretation of TMT</b>   |     |
|   |                    | <ol style="list-style-type: none"> <li>Criteria for TMT positive test contraindication for TMT conditions where TMT is not useful,</li> </ol>  | CO1 |

|   |                              |  |             |
|---|------------------------------|--|-------------|
|   |                              | b) Complications that may occur in TMT room and its management<br>c) Others  |             |
|   | <b>Unit 3</b>                | <b>Use of defibrillator</b>  |             |
|   |                              | a) Indications,<br>b) How to use the defibrillator,<br>c) Complications during the procedure and its management  | CO1         |
|   | <b>Unit 4</b>                | <b>Management of cardiac arrest</b>  |             |
|   |                              | a) Definition,<br>b) Causes external cardiac massage,<br>c) Artificial respiration and other drugs and procedures used in the management of Cardiac arrest   | CO1,<br>CO2 |
|   | <b>Unit 5</b>                | <b>Myocardial perfusion scan</b>   |             |
|   |                              | a) Procedures and<br>b) usefulness of myocardial perfusion scan<br>c) precautions  | CO1,<br>CO2 |
|   | <b>Unit 6</b>                | <b>Cardiac arrhythmias</b>   |             |
|   |                              | a) Bradyarrhythmia and Tachy arrhythmias and ECG diagnosis of all rhythm disturbances.<br>b) Sinus arrhythmia, APC, FPC, VPC, VF, VT, AF, SVT,<br>c) I <sup>o</sup> HB, II <sup>o</sup> HB, complete heart block | CO1,<br>CO2 |
|   | <b>Unit 7</b>                | <b>Electrolyte disturbances</b>  |             |
|   |                              | a) ECG in hypokelemlia,<br>b) hyperkelemlia<br>c) others etc   | CO1,<br>CO2 |
|   | <b>Unit 8</b>                | <b>Holter monitoring</b>   |             |
|   |                              | a) Procedure and<br>b) Usefulness<br>c) precautions  | CO1,<br>CO2 |
| 1 | <b>Course Code</b>           | <b>BCT 523</b>   |             |
| 2 | <b>Course Title</b>          | <b>Cardiac Care Technology-Advanced- I(LAB)</b>  |             |
| 3 | <b>Credit Hours</b>          | <b>2</b>   |             |
| 4 | <b>Contact Hours (L-T-P)</b> | <b>0-0-4</b>   |             |
| 5 | <b>Course Outcomes</b>       | 1.Graduates will be able to understand normal ECG, basic abnormalities of ECG in various disease,<br><br>2.Graduates will be able to understand findings of ECHO in various                                      |             |

|   |                    |  |     |
|---|--------------------|--|-----|
|   |                    | <p>diseases</p> <p>3. Graduates will be able to know equipment details, handling and radiation hazards of cardiac catheterization lab.</p> <p>4. Graduates will be able to know materials used in cath. lab and their sterilization technique</p> <p>5. Graduates will be able to know different aspects of coronary angiography and peripheral angiogram.</p>   |     |
| 6 | Course Description | <ul style="list-style-type: none"> <li>• <b>Cardiac monitoring</b></li> <li>• <b>Interpretation of TMT</b></li> <li>• <b>Use of defibrillator</b></li> <li>• <b>Management of cardiac arrest</b></li> <li>• <b>Myocardial perfusion scan</b></li> <li>• <b>Cardiac arrhythmias</b></li> <li>• <b>Electrolyte disturbances</b></li> <li>• <b>Holter monitoring</b></li> <li>• <b>Valvoplasties</b></li> <li>• <b>Coil closure and device closure of PDA</b></li> <li>• <b>Device closure of ASD, VSD</b></li> <li>• <b>Pressure recording, pacing, pregnancy, nuclear cardiology</b></li> </ul> |     |
|   | <b>Practicals</b>  |  |     |
|   | <b>Unit 1</b>      | <b>Cardiac monitoring</b>  |     |
|   |                    | <p>d) Definition,</p> <p>e) Purpose of cardiac monitoring,</p> <p>f) How to Recognise various arrhythmias<br/>How to set up a intensive coronary care unit and usefulness of ICCU</p>  | CO1 |
|   | <b>Unit 2</b>      | <b>Interpretation of TMT</b>   |     |
|   |                    | <p>d) Criteria for TMT positive test contraindication for TMT conditions where TMT is not useful,</p> <p>e) Complications that may occur in TMT room and its management</p> <p>f) Others</p>   | CO1 |
|   | <b>Unit 3</b>      | <b>Use of defibrillator</b>  |     |
|   |                    | <p>d) Indications,</p> <p>e) How to use the defibrillator,</p> <p>f) Complications during the procedure and its management</p>   | CO1 |
|   | <b>Unit 4</b>      | <b>Management of cardiac</b>   |     |

|                                       |  |     |             |
|---------------------------------------|--|-----|-------------|
|                                       | <b>arrest</b>  |     |             |
|                                       | d) Definition,<br>e) Causes external cardiac massage,<br>f) Artificial respiration and other drugs and procedures used in the management of Cardiac arrest   |     | CO1,<br>CO2 |
| <b>Unit 5</b>                         | <b>Myocardial perfusion scan</b>   |     |             |
|                                       | d) Procedures and<br>e) usefulness of myocardial perfusion scan<br>f) precautions  |     | CO1,<br>CO2 |
| <b>Unit 6</b>                         | <b>Cardiac arrhythmias</b>   |     |             |
|                                       | d) Bradyarrhythmia and Tachy arrhythmias and ECG diagnosis of all rhythm disturbances.<br>e) Sinus arrhythmia, APC, FPC, VPC, VF, VT, AF, SVT,<br>f) I <sup>0</sup> HB, II <sup>0</sup> HB, complete heart block |     | CO1,<br>CO2 |
| <b>Unit 7</b>                         | <b>Electrolyte disturbances</b>  |     |             |
|                                       | d) ECG in hypokalemia,<br>e) hyperkalemia<br>f) others etc   |     | CO1,<br>CO2 |
| <b>Unit 8</b>                         | <b>Holter monitoring</b>   |     |             |
|                                       | d) Procedure and<br>e) Usefulness<br>f) precautions  |     | CO1,<br>CO2 |
|                                       |  |     |             |
| Mode of examination                   | Theory and Practical   |     |             |
| Weightage Distribution for Theory     | CA   | MTE | ETE         |
| Weightage Distribution for Practicals | CA   | MTE | ETE         |
| Text book/s*                          | The Complete Guide to ECGs<br>Practical Cardiovascular Medicine<br>The Cardiac Catheterization Handbook  |     |             |

| POs<br>Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1        | 2   | 3   | 1   | 3   | 2   | 1   | 2   | 2    | 2    | 3    |
| CO2        | 3   | 3   | 2   | 2   | 3   | 2   | 3   | 2    | 3    | 2    |
| CO3        | 2   | 3   | 2   | 3   | 3   | 3   | 3   | 2    | 3    | 3    |
| CO4        | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3    | 2    | 2    |
| CO5        | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2    | 2    | 2    |

**BCT 611: Cardiac Care Technology- Clinical II& BCT 621: Cardiac Care Technology –  
Clinical II- (Lab)**

|  |                          |  |  |
|--|--------------------------|--|--|
| <b>School: SAHS</b>                              |                          | <b>Batch : 2021-25</b>   |  |
| <b>Program: BCVT</b>                             |                          | <b>Current Academic Year: 2023-2024</b>  |  |
| <b>Branch:<br/>Cardiovascular<br/>Technology</b> |                          | <b>Semester: 6</b>   |  |
| 1  | Course Code              | <b>BCT 611</b>   |  |
| 2  | Course Title             | Cardiac Care Technology clinical - II  |  |
| 3  | Credit Hours             | <b>8</b>   |  |
| 4  | Contact Hours<br>(L-T-P) | <b>4-2-4</b>   |  |
|  | Course Status            | Compulsory   |  |
| 5  | Course Objective         | <ul style="list-style-type: none"> <li>• To trained the students in the understanding of cardiac disease development</li> <li>• To make the students able to do routine investigation to identy various cardiac disease</li> <li>• To prepare students for provind assistance to cardiologist</li> <li>• To provide the conceptual basis for understanding of various maneuver for diagnosis and interpretation of cardiac disease</li> <li>• To develop diagnostic skills in cardiovascular technology</li> </ul> |  |
| 6  | Course Outcomes          | 6. Graduates will be able to understand normal ECG, basic abnormalities of ECG in various disease,   |  |



|   |                    |   |            |
|---|--------------------|---|------------|
|   |                    | <p>7. Graduates will be able to understand findings of ECHO in various diseases</p> <p>8. Graduates will be able to know equipment details, handling and radiation hazards of cardiac catheterization lab.</p> <p>9. Graduates will be able to know materials used in cath. lab and their sterilization technique</p> <p>10. Graduates will be able to know different aspects of coronary angiography and peripheral angiogram.</p> |            |
| 7 | Course Description | <ul style="list-style-type: none"> <li>• <b>Interpretation of Normal ECG and Basic abnormalities of ECG in RHD, IHD &amp; CHD</b></li> <li>• <b>Echo in RHD,CHD,IHD, pericardial disease and other CVD</b></li> <li>• <b>Assessment of cardiac function</b></li> <li>• <b>Cardiac catheterization and coronary angiogram</b></li> </ul>   |            |
| 8 | Outline syllabus   |   |            |
|   | <b>Theory</b>      |   |            |
|   | <b>Unit 1</b>      | <b>Cardiac catheterisation laboratory</b>   |            |
|   |                    | <p>a) General details of cardiac catheterisation equipment;</p> <p>b) How to handle the machine, common problems one may come across;</p> <p>c) How to overcome it, radiation hazards.</p>  | <b>CO4</b> |
|   | <b>Unit 2</b>      | <b>Materials used in the cathlab</b>  |            |
|   |                    | <p>a) All catheters, balloons, guidewires, pacemakers contrast material;</p> <p>b) Other material used in the cardiac catheterisation laboratory;</p> <p>c) Sterilization of all these materials</p>  | <b>CO4</b> |
|   | <b>Unit 3</b>      | <b>Right heart catheterisation</b>  |            |
|   |                    | <p>a) Procedure;Cath position;</p> <p>b) Oxymetry at various levels;</p> <p>c) Angios done and its interpretation</p>   | <b>CO5</b> |
|   | <b>Unit 4</b>      | <b>Left heart catheterisation</b>   |            |

|   |                              |  |     |
|---|------------------------------|--|-----|
|   |                              | a) Procedure;Cath position;<br>b) Oxymetry at various levels;<br>c) Angios done and its interpretation   | CO5 |
|   | <b>Unit-5</b>                | <b>Coronary angiogram</b>  |     |
|   |                              | a) Procedure,Materials used,<br>b) Type and amount dye used, Indications and contraindications,<br>c) Various pictures recorded in various angles and gross interpretation.  | CO5 |
|   | <b>Unit-6</b>                | <b>Peripheral angiogram</b>  |     |
|   |                              | a) Procedure,Materials used,<br>b) Type and amount dye used, Indications and contraindications,<br>Various pictures recorded in various angles and gross interpretation  | CO5 |
| 1 | <b>Course Code</b>           | <b>BCT 621</b>   |     |
| 2 | <b>Course Title</b>          | <b>Cardiac Care Technology-Clinical – II (LAB)</b>   |     |
| 3 | <b>Credit Hours</b>          | <b>2</b>   |     |
| 4 | <b>Contact Hours (L-T-P)</b> | <b>0-0-4</b>   |     |
| 5 | Course Outcomes              | 6. Graduates will be able to understand normal ECG, basic abnormalities of ECG in various disease,<br><br>7. Graduates will be able to understand findings of ECHO in various diseases<br><br>8. Graduates will be able to know equipment details, handling and radiation hazards of cardiac catheterization lab.<br><br>9. Graduates will be able to know materials used in cath. lab and their sterilization technique<br><br>10. Graduates will be able to know different aspects of coronary angiography and peripheral angiogram. |     |
| 6 | Course Description           | <ul style="list-style-type: none"> <li>• <b>Interpretation of Normal ECG and Basic abnormalities of ECG in RHD, IHD &amp; CHD</b></li> <li>• <b>Echo in RHD,CHD,IHD, pericardial disease and other CVD</b></li> <li>• <b>Assessment of cardiac function</b></li> </ul>   |     |

|  |                                      |   |                 |     |
|--|--------------------------------------|---|-----------------|-----|
|  |                                      | <ul style="list-style-type: none"> <li>• Cardiac catheterization and coronary angiogram</li> </ul>  |                 |     |
|  | <b>Practicals</b>                    |   |                 |     |
|  | <b>Unit 1</b>                        | Echo<br>a) Pericardial effusion,<br>b) Cardiac tamponade,<br>c) Constrictive pericarditis   | CO2<br>,        |     |
|  | <b>Unit 2</b>                        | a) General details of cardiac catheterisation equipment;<br>b) How to handle the machine, common problems one may come across;<br>c) How to overcome it, radiation hazard                                       | CO3<br>,<br>CO4 |     |
|  | <b>Unit 3</b>                        | Materials in cath lab.<br>a) All catheters, balloons, guidewires, pacemakers contrast material;<br>b) Other material used in the cardiac catheterisation laboratory;<br>c) Sterilization of all these materials | CO3<br>,<br>CO4 |     |
|  | <b>Unit 4</b>                        | Catheterisation<br>a) Procedure;Cath position;<br>b) Oxymetry at various levels;<br>c) Angios done and its interpretation   | CO5             |     |
|  | <b>Unit 5</b>                        | Angiogram<br>a) Procedure,Materials used,<br>b) Type and amount dye used, Indications and contraindications,<br>c) Various pictures recorded in various angles and gross interpretation.                        | CO5             |     |
|  |                                      |   |                 |     |
|  | Mode of examination                  | Theory and Practical  |                 |     |
|  | Weightage Distribution for Theory    | CA  | MTE             | ETE |
|  |                                      |   |                 |     |
|  | Weightage Distribution for Practical | CA  | MTE             | ETE |
|  |                                      |   |                 |     |

|  |              |  |  |
|--|--------------|--|--|
|  | Text book/s* |  |  |
|--|--------------|--|--|

| POs<br>Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1        | 2   | 3   | 1   | 3   | 2   | 1   | 2   | 2    | 2    | 3    |
| CO2        | 3   | 3   | 2   | 2   | 3   | 2   | 3   | 2    | 3    | 2    |
| CO3        | 2   | 3   | 2   | 3   | 3   | 3   | 3   | 2    | 3    | 3    |
| CO4        | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3    | 2    | 2    |
| CO5        | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2    | 2    | 2    |

**BCT 612: Cardiac Care Technology- Applied II & BCT 622: Cardiac Care Technology Applied  
II- (Lab)**

|  |  |  |
|--|--|--|
| <b>School: SAHS</b>                              | <b>Batch : 2021-25</b>   |  |
| <b>Program: BCVT</b>                             | <b>Current Academic Year: 2022-2023</b>  |  |
| <b>Branch:<br/>Cardiovascular<br/>Technology</b> | <b>Semester: 6</b>   |  |
| 1 Course Code                                    | <b>BCT 612</b>   |  |
| 2 Course Title                                   | Cardiac Care Technology Applied - II   |  |
| 3 Credit Hours                                   | <b>8</b>   |  |
| 4 Contact Hours<br>(L-T-P)                       | <b>4-2-4</b>   |  |
| Course Status                                    | Compulsory   |  |
| 5 Course<br>Objective                            | <ul style="list-style-type: none"> <li>To trained the students in the understanding of cardiac disease development</li> <li>To make the students able to do routine investigation to identify various cardiac disease</li> <li>To prepare students for provind assistance to cardiologist</li> <li>To provide the conceptual basis for understanding of various</li> </ul> |  |

|   |                    |   |                 |
|---|--------------------|---|-----------------|
|   |                    | <p>maneuver for diagnosis and interpretation of cardiac disease</p> <ul style="list-style-type: none"> <li>To develop diagnostic skills in cardiovascular technology</li> </ul>   |                 |
| 6 | Course Outcomes    | <ol style="list-style-type: none"> <li>1. Graduates will be able to understand normal ECG, basic abnormalities of ECG in various disease,</li> <li>2. Graduates will be able to understand findings of ECHO in various diseases</li> <li>3. Graduates will be able to know equipment details, handling and radiation hazards of cardiac catheterization lab.</li> <li>4. Graduates will be able to know materials used in cath. lab and their sterilization technique</li> <li>5. Graduates will be able to know different aspects of coronary angiography and peripheral angiogram.</li> </ol> |                 |
| 7 | Course Description | <ul style="list-style-type: none"> <li>• <b>Interpretation of Normal ECG and Basic abnormalities of ECG in RHD, IHD &amp; CHD</b></li> <li>• <b>Echo in RHD,CHD,IHD, pericardial disease and other CVD</b></li> <li>• <b>Assessment of cardiac function</b></li> <li>• <b>Cardiac catheterization and coronary angiogram</b></li> </ul>   |                 |
| 8 | Outline syllabus   |   |                 |
|   | <b>Theory</b>      |   |                 |
|   | <b>Unit 1</b>      | <b>Stress Echo</b>  |                 |
|   |                    | <ol style="list-style-type: none"> <li>d) procedure</li> <li>e) indications</li> <li>f) Precautions</li> </ol>  | <b>CO2</b>      |
|   | <b>Unit 2</b>      | <b>Peripheral Doppler</b>   |                 |
|   |                    | <ol style="list-style-type: none"> <li>a) Procedure and</li> <li>b) usefulness of peripheral Doppler</li> <li>c) indications and contraindications</li> </ol>   | <b>CO2</b>      |
|   | <b>Unit 3</b>      | <b>Coronary angioplasty</b>   |                 |
|   |                    | <ol style="list-style-type: none"> <li>a) Procedure,</li> <li>b) Materials used,</li> </ol>   | <b>CO3, CO4</b> |

|   |                              |   |                     |
|---|------------------------------|---|---------------------|
|   |                              | c) Complication one may encounter and how to manage it  |                     |
|   | <b>Unit 4</b>                | <b>Peripheral angioplasty</b>   |                     |
|   |                              | a) Procedure,<br>b) Materials used,<br>c) Complication one may encounter and how to manage it   | <b>CO3,<br/>CO4</b> |
|   | <b>Unit 5</b>                | <b>Fetal echocardiogram</b>   |                     |
|   |                              | a) Procedure,<br>b) Basic interpretation<br>c) indications  | CO2                 |
|   | <b>Unit-6</b>                | <b>Contrast echocardiogram</b>  |                     |
|   |                              | a) procedure and<br>b) usefulness of contrast echocardiogram<br>c) indications  | CO4,<br>CO5         |
|   | <b>Unit-7</b>                | <b>Myocardial contrast echo</b>   | CO3,CO4<br>, CO5    |
|   |                              | a) indications<br>b) contraindications<br>c) procedure  |                     |
| 1 | <b>Course Code</b>           | <b>BCT 622</b>  |                     |
| 2 | <b>Course Title</b>          | <b>Cardiac Care Technology-Applied II (LAB)</b>   |                     |
| 3 | <b>Credit Hours</b>          | <b>2</b>  |                     |
| 4 | <b>Contact Hours (L-T-P)</b> | <b>0-0-4</b>  |                     |
| 5 | <b>Course Outcomes</b>       | <p>1.Graduates will be able to understand normal ECG, basic abnormalities of ECG in various disease,</p> <p>2.Graduates will be able to understand findings of ECHO in various diseases</p> <p>3.Graduates will be able to know equipment details, handling and radiation hazards of cardiac catheterization lab.</p> <p>4.Graduates will be able to know materials used in cath. lab and</p> |                     |

|   |                    |  |                     |
|---|--------------------|--|---------------------|
|   |                    | <p>their sterilization technique</p> <p>5. Graduates will be able to know different aspects of coronary angiography and peripheral angiogram.</p>  |                     |
| 6 | Course Description | <ul style="list-style-type: none"> <li>• <b>Interpretation of Normal ECG and Basic abnormalities of ECG in RHD, IHD &amp; CHD</b></li> <li>• <b>Echo in RHD, CHD, IHD, pericardial disease and other CVD</b></li> <li>• <b>Assessment of cardiac function</b></li> </ul> |                     |
|   | <b>Practicals</b>  |  |                     |
|   | <b>Unit 1</b>      | <p>Echo</p> <p>d) Pericardial effusion,<br/>e) Cardiac tamponade,<br/>f) Constrictive pericarditis</p>   | CO2                 |
|   | <b>Unit 2</b>      | <p>d) General details of cardiac catheterisation equipment;<br/>e) How to handle the machine, common problems one may come across;<br/>f) How to overcome it, radiation hazard</p>   | CO3,<br>CO4         |
|   | <b>Unit 3</b>      | <p>Materials in cath lab.</p> <p>d) All catheters, balloons, guidewires, pacemakers contrast material;<br/>e) Other material used in the cardiac catheterisation laboratory;<br/>f) Sterilization of all these materials</p>   | CO3,<br>CO4,<br>CO5 |
|   | <b>Unit 4</b>      | <p>Catheterisation</p> <p>d) Procedure; Cath position;<br/>e) Oxymetry at various levels;<br/>f) Angiogram and its interpretation</p>  | CO4, CO5            |
|   | <b>Unit 5</b>      | <p>Angiogram</p> <p>d) Procedure, Materials used,<br/>e) Type and amount dye used, Indications and contraindications,<br/>f) Various pictures recorded in various angles and gross interpretation.</p>   | CO4, CO5            |

|  |                                       |                      |     |     |
|--|---------------------------------------|----------------------|-----|-----|
|  |                                       |                      |     |     |
|  |                                       |                      |     |     |
|  | Mode of examination                   | Theory and Practical |     |     |
|  | Weightage Distribution for Theory     | CA                   | MTE | ETE |
|  |                                       | 30%                  | 20% | 50% |
|  | Weightage Distribution for Practicals | CA                   | MTE | ETE |
|  |                                       | 60%                  |     | 40% |
|  | Text book/s*                          |                      |     |     |

| POs<br>Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1        | 2   | 3   | 1   | 3   | 2   | 1   | 2   | 2    | 2    | 3    |
| CO2        | 3   | 3   | 2   | 2   | 3   | 2   | 3   | 2    | 3    | 2    |
| CO3        | 2   | 3   | 2   | 3   | 3   | 3   | 3   | 2    | 3    | 3    |
| CO4        | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3    | 2    | 2    |
| CO5        | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2    | 2    | 2    |

**BCT 613: Cardiac Care Technology- Advanced II & BCT 623: Cardiac Care Technology**

**AdvancedII- (Lab)**

|                                   |                                       |  |
|-----------------------------------|---------------------------------------|--|
| <b>School: SAHS</b>               | <b>Batch : 2021-25</b>                |  |
| <b>Program: BCVT</b>              | <b>Current Academic Year: 2023-24</b> |  |
| <b>Branch:<br/>Cardiovascular</b> | <b>Semester : 3</b>                   |  |

SU/SAHS/BCVT



| <b>Technology</b> |                       |   |
|-------------------|-----------------------|---|
| 1                 | Course Code           | <b>BCT 613</b>  |
| 2                 | Course Title          | Cardiac Care Technology – Advanced II   |
| 3                 | Credit Hours          | <b>8</b>  |
| 4                 | Contact Hours (L-T-P) | <b>4-2-4</b>  |
|                   | Course Status         | Compulsory  |
| 5                 | Course Objective      | <ul style="list-style-type: none"> <li>• To trained the students in the understanding of cardiac disease development</li> <li>• To make the students able to do routine investigation to identify various cardiac disease</li> <li>• To prepare students for provide assistance to cardiologist</li> <li>• To provide the conceptual basis for understanding of various maneuver for diagnosis and interpretation of cardiac disease</li> <li>• To develop diagnostic skills in cardiovascular technology</li> </ul>                          |
| 6                 | Course Outcomes       | <p>6. Graduates will be able to understand normal ECG, basic abnormalities of ECG in various disease,</p> <p>7. Graduates will be able to understand findings of ECHO in various diseases</p> <p>8. Graduates will be able to know equipment details, handling and radiation hazards of cardiac catheterization lab.</p> <p>9. Graduates will be able to know materials used in cath. lab and their sterilization technique</p> <p>10. Graduates will be able to know different aspects of coronary angiography and peripheral angiogram.</p> |
| 7                 | Course Description    | <ul style="list-style-type: none"> <li>• <b>Cardiac monitoring</b></li> <li>• <b>Interpretation of TMT</b></li> <li>• <b>Use of defibrillator</b></li> <li>• <b>Management of cardiac arrest</b></li> <li>• <b>Myocardial perfusion scan</b></li> <li>• <b>Cardiac arrhythmias</b></li> <li>• <b>Electrolyte disturbances</b></li> <li>• <b>Holter monitoring</b></li> </ul>  |

|   |                                |   |                      |
|---|--------------------------------|---|----------------------|
|   |                                | <ul style="list-style-type: none"> <li>• <b>Valvoplasties</b></li> <li>• <b>Coil closure and device closure of PDA</b></li> <li>• <b>Device closure of ASD,VSD</b></li> <li>• <b>Pressure recording, pacing, pregnancy, nuclear cardiology</b></li> </ul> |                      |
| 8 | <b>Outline syllabus Theory</b> |   |                      |
|   | <b>Unit 1</b>                  | <b>Valvoplasties</b>  |                      |
|   |                                | a) Procedure,<br>b) Indications,<br>c) Complications and treatment of ballons, mitral valvuloplasty, ballon aortic valvuloplasty ballon pulmonary valvuloplasty and balloon tricuspid valvuloplasty.  | <b>CO2, CO3</b>      |
|   | <b>Unit 2</b>                  | <b>Coil closure and device closure of PDA</b>   |                      |
|   |                                | a) Procedure,<br>b) Indications ;<br>c) Materials used for coil and device closure of PDA   | <b>CO2, CO3, CO4</b> |
|   | <b>Unit 3</b>                  | <b>Device closure of ASD</b>  |                      |
|   |                                | a) Procedure,<br>b) Indications;<br>c) Materials used for device closure of ASD   | <b>CO2, CO3, CO4</b> |
|   | <b>Unit 4</b>                  | <b>Device closure of VSD</b>  |                      |
|   |                                | a) Procedure,<br>b) Indications;<br>c) Materials used for device closure of ASD   | <b>CO2, CO3, CO4</b> |
|   | <b>Unit 5</b>                  | <b>Electrophysiological studies</b>   |                      |
|   |                                | a) Basic knowledge of EP studies<br>b) Mapping and<br>c) Ablation   | <b>CO1, CO3, CO4</b> |
|   | <b>Unit 6</b>                  | <b>Oxymetry</b>   |                      |
|   |                                | a) Handling of the instrument;<br>b) Usefulness of the instrument,<br>c) normal and abnormal values   | <b>CO1,CO3 , CO4</b> |

|   |                              |  |                     |
|---|------------------------------|--|---------------------|
|   | <b>Unit 7</b>                | <b>Pressure recording</b>  |                     |
|   |                              | a) Handling of the instrument;<br>b) Pressures in various chambers,<br>c) normal and abnormal values   | CO4,<br>CO5         |
|   | <b>Unit 8</b>                | <b>Temporary and permanent pacing</b>  |                     |
|   |                              | a) Materials used,<br>b) Procedure,<br>c) Complications one may encounter and management.<br>Implantable Cardioverter defibrillator devices  | CO1,<br>CO3,<br>CO4 |
|   | <b>Unit 9</b>                | <b>CD recording and storage-</b>   |                     |
|   |                              | a) Recording<br>b) and Storage of all the procedures over CD<br>c) other   | CO5                 |
|   | <b>Unit 10</b>               | <b>Procedure during pregnancy</b>  |                     |
|   |                              | a) Precautions to be followed.<br>b) Safety<br>c) other  | CO3,CO4<br>, CO5    |
|   | <b>Unit 11</b>               | <b>Nuclear Cardiology</b>  |                     |
|   |                              | a) Instrumentation,<br>b) Radiopharmaceuticals<br>c) others  | CO3,<br>CO4,<br>CO5 |
| 1 | <b>Course Code</b>           | <b>BCT 623</b>   |                     |
| 2 | <b>Course Title</b>          | <b>Cardiac Care Technology-Advanced II (LAB)</b>   |                     |
| 3 | <b>Credit Hours</b>          | <b>2</b>   |                     |
| 4 | <b>Contact Hours (L-T-P)</b> | <b>0-0-4</b>   |                     |
| 5 | <b>Course Outcomes</b>       | 1.Graduates will be able to understand normal ECG, basic abnormalities of ECG in various disease,<br><br>2.Graduates will be able to understand findings of ECHO in various diseases<br><br>3.Graduates will be able to know equipment details, handling and radiation hazards of cardiac catheterization lab. |                     |

|   |                    |  |                      |
|---|--------------------|--|----------------------|
|   |                    | <p>4. Graduates will be able to know materials used in cath. lab and their sterilization technique</p> <p>5. Graduates will be able to know different aspects of coronary angiography and peripheral angiogram.</p>  |                      |
| 6 | Course Description | <ul style="list-style-type: none"> <li>• <b>Cardiac monitoring</b></li> <li>• <b>Interpretation of TMT</b></li> <li>• <b>Use of defibrillator</b></li> <li>• <b>Management of cardiac arrest</b></li> <li>• <b>Myocardial perfusion scan</b></li> <li>• <b>Cardiac arrhythmias</b></li> <li>• <b>Electrolyte disturbances</b></li> <li>• <b>Holter monitoring</b></li> <li>• <b>Valvoplasties</b></li> <li>• <b>Coil closure and device closure of PDA</b></li> <li>• <b>Device closure of ASD, VSD</b></li> <li>• <b>Pressure recording, pacing, pregnancy, nuclear cardiology</b></li> </ul> |                      |
|   | <b>Practicals</b>  |  |                      |
|   | <b>Unit 1</b>      | <b>Holter monitoring</b>   |                      |
|   |                    | g) Procedure and<br>h) Usefulness<br>i) precautions  | <b>CO1, CO2</b>      |
|   | <b>Unit 2</b>      | <b>Valvoplasties</b>   |                      |
|   |                    | d) Procedure,<br>e) Indications,<br>f) Complications and treatment of ballons, mitral valvuloplasty, ballon aortic valvuloplasty ballon pulmonary valvuloplasty and balloon tricuspid valvuloplasty.   | <b>CO2, CO3</b>      |
|   | <b>Unit 3</b>      | <b>Coil closure and device closure of PDA</b>  |                      |
|   |                    | d) Procedure,<br>e) Indications ;<br>f) Materials used for coil and device closure of PDA  | <b>CO2, CO3, CO4</b> |

|                |   |                     |
|----------------|---|---------------------|
| <b>Unit 4</b>  | <b>Device closure of ASD</b>  |                     |
|                | d) Procedure,<br>e) Indications;<br>f) Materials used for device closure of ASD   | CO2,<br>CO3,<br>CO4 |
| <b>Unit 5</b>  | <b>Device closure of VSD</b>  |                     |
|                | d) Procedure,<br>e) Indications;<br>f) Materials used for device closure of ASD   | CO2,<br>CO3,<br>CO4 |
| <b>Unit 6</b>  | <b>Electrophysiological studies</b>   |                     |
|                | d) Basic knowledge of EP studies<br>e) Mapping and<br>f) Ablation   | CO1,<br>CO3,<br>CO4 |
| <b>Unit 7</b>  | <b>Oxymetry</b>   |                     |
|                | d) Handling of the instrument;<br>e) Usefulness of the instrument,<br>f) normal and abnormal values   | CO1,CO3<br>, CO4    |
| <b>Unit 8</b>  | <b>Pressure recording</b>   |                     |
|                | d) Handling of the instrument;<br>e) Pressures in various chambers,<br>f) normal and abnormal values  | CO4,<br>CO5         |
| <b>Unit 9</b>  | <b>Temporary and permanent pacing</b>   |                     |
|                | d) Materials used,<br>e) Procedure,<br>f) Complications one may encounter and management.<br>Implantable Cardioverter defibrillator devices | CO1,<br>CO3,<br>CO4 |
| <b>Unit 10</b> | <b>CD recording and storage-</b>  |                     |
|                | d) Recording<br>e) and Storage of all the procedures over CD<br>f) other  | CO5                 |
| <b>Unit 11</b> | <b>Procedure during pregnancy</b>   |                     |
|                | d) Precautions to be followed.<br>e) Safety<br>f) other   | CO3,CO4<br>, CO5    |

| <b>Unit 12</b>                        | <b>Nuclear Cardiology</b>   |     |     |                     |
|---------------------------------------|---|-----|-----|---------------------|
|                                       | d) Instrumentation,<br>e) Radiopharmaceuticals<br>f) others   |     |     | CO3,<br>CO4,<br>CO5 |
|                                       |   |     |     |                     |
| Mode of examination                   | Theory and Practical  |     |     |                     |
| Weightage Distribution for Theory     | CA  | MTE | ETE |                     |
|                                       | 30 %  | 20% | 50% |                     |
| Weightage Distribution for Practicals | CA  | MTE | ETE |                     |
|                                       | 60 %  |     | 40% |                     |
| Text book/s*                          | The Complete Guide to ECGs<br>Practical Cardiovascular Medicine<br>The Cardiac Catheterization Handbook |     |     |                     |

| POs<br>Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 |
|------------|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1        | 2   | 3   | 1   | 3   | 2   | 1   | 2   | 2    | 2    | 3    |
| CO2        | 3   | 3   | 2   | 2   | 3   | 2   | 3   | 2    | 3    | 2    |
| CO3        | 2   | 3   | 2   | 3   | 3   | 3   | 3   | 2    | 3    | 3    |
| CO4        | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3    | 2    | 2    |
| CO5        | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2    | 2    | 2    |

**BCT721:Cardiovascular Technology Internship & Project work - I**

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|  |   |
|--|---|
| School: SAHS                                     | Batch : 2021-2025   |
| Program:<br>BCVT                                 | Current Academic Year: 2024-25  |
| <b>Branch:<br/>Cardiovascular<br/>Technology</b> | <b>Semester : 7</b>   |
| 1 Course Title                                   | BCT 721   |
| 2 Course Title                                   | Cardiovascular Technology Internship & Project work   |
| 3 Credit Hours                                   | <b>20</b>   |
| 3 Course Status                                  | Compulsory  |
| 4 Internship Objective                           | <ul style="list-style-type: none"> <li>• To help the students to identify and understanding of cardiac disease development</li> <li>• To train the students for routine investigation of cardiac diseases.</li> <li>• To prepare students for providing assistance to cardiologists.</li> <li>• To provide the conceptual basis for understanding of various manoeuvre for diagnosis and interpretation of cardiac diseases.</li> <li>• To develop diagnostic skills in cardiovascular technology.</li> </ul> |
| 5 Internship Outcomes                            | 11. Graduates will be able to understand normal ECG, basic abnormalities of   |

|   |                        |   |
|---|------------------------|---|
|   |                        | <p>ECG in various diseases.</p> <p>12. Graduates will be able to understand findings of ECHO in various diseases</p> <p>13. Graduates will be able to know equipment details, handling and radiation hazards of cardiac catheterization lab.</p> <p>14. Graduates will be able to know materials used in cath. lab and their sterilization technique</p> <p>15. Graduates will be able to know different aspects of coronary angiography and peripheral angiogram.</p>  |
| 6 | Internship Description | <ul style="list-style-type: none"> <li>• Electrocardiography (ECG)</li> <li>• Cardiac monitoring</li> <li>• Interpretation of TMT</li> <li>• Echocardiogram</li> <li>• Use of defibrillator</li> <li>• Management of cardiac arrest</li> <li>• Myocardial perfusion scan</li> <li>• Cardiac arrhythmias</li> <li>• Electrolyte disturbances</li> <li>• Holter monitoring</li> <li>• Assessment of cardiac function</li> <li>• Cardiac catheterization and coronary angiogram/angioplasty</li> <li>• Valvoplasties</li> <li>• Coil closure and device closure of PDA</li> <li>• Device closure of ASD,VSD</li> <li>• Pressure recording, pacing, Procedure during pregnancy, nuclear cardiology</li> </ul> |

1. The students will be posted to the following departments/section of the cardiology unit of a hospital in a span of 12 months.

| S. No. | Department/Section    |
|--------|-----------------------|
| 1.     | Electrocardiography   |
| 2.     | TMT & Holter monitor  |
| 3.     | ECHO                  |
| 4.     | Cath Lab              |
| 5.     | Cardiac OT            |
| 6.     | ICU/CCU/Recovery Room |



### Guidelines for Project work

1. During internship and project work, students will have to maintain a file.

In the file, collected data & diagnostic procedure (or surgery) of patients should be recorded.

### 2. Project Work

On the given topic, student will collect the data of patients (as many as possible) and submit the project report before Viva Voce.

The project work will be taken up by a student on an area identified in the process of internship.

The assessment of the course will be done based on the following criteria:

- i. Attendances
- ii. Case Study
- iii. Report
- iv. Presentation

The report should base the following points:

- i. Causes
- ii. Risk Factors
- iii. Prevalence
- iv. Post Treatment Effects on Patients
- v. Precautions Or Suggestions for Patients
- vi. Conclusive Remarks (by Presenter)

Note - During the internship period, student must attend all mentioned departments for the given time period.

### BCT801:Cardiovascular Technology Internship & Project work - II

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|  |   |  |
|--|---|--|
| School: SAHS                                     | Batch : 2021-2025   |  |
| Program:<br>BCVT                                 | Current Academic Year: 2024-25  |  |
| <b>Branch:<br/>Cardiovascular<br/>Technology</b> | <b>Semester : 8</b>   |  |
| 1 Course<br>Title                                | BCT 821   |  |
| 2 Course Title                                   | Cardiovascular Technology Internship & Project work                     |  |
| 3 Credit Hours                                   | <b>20</b>   |  |
| 3 Course<br>Status                               | Compulsory  |  |
| 4 Internship<br>Objective                        | • To help the students to identify and understanding of cardiac disease |  |

|   |                        |  |  |
|---|------------------------|--|--|
|   |                        | <p>development</p> <ul style="list-style-type: none"> <li>• To train the students for routine investigation of cardiac diseases.</li> <li>• To prepare students for providing assistance to cardiologists.</li> <li>• To provide the conceptual basis for understanding of various manoeuvre for diagnosis and interpretation of cardiac diseases.</li> <li>• To develop diagnostic skills in cardiovascular technology.</li> </ul>  |  |
| 5 | Internship Outcomes    | <p>16. Graduates will be able to understand normal ECG, basic abnormalities of ECG in various diseases.</p> <p>17. Graduates will be able to understand findings of ECHO in various diseases</p> <p>18. Graduates will be able to know equipment details, handling and radiation hazards of cardiac catheterization lab.</p> <p>19. Graduates will be able to know materials used in cath. lab and their sterilization technique</p> <p>20. Graduates will be able to know different aspects of coronary angiography and peripheral angiogram.</p>   |  |
| 6 | Internship Description | <ul style="list-style-type: none"> <li>• Electrocardiography (ECG)</li> <li>• Cardiac monitoring</li> <li>• Interpretation of TMT</li> <li>• Echocardiogram</li> <li>• Use of defibrillator</li> <li>• Management of cardiac arrest</li> <li>• Myocardial perfusion scan</li> <li>• Cardiac arrhythmias</li> <li>• Electrolyte disturbances</li> <li>• Holter monitoring</li> <li>• Assessment of cardiac function</li> <li>• Cardiac catheterization and coronary angiogram/angioplasty</li> <li>• Valvoplasties</li> <li>• Coil closure and device closure of PDA</li> <li>• Device closure of ASD, VSD</li> <li>• Pressure recording, pacing, Procedure during pregnancy, nuclear cardiology</li> </ul> |  |

1. The students will be posted to the following departments/section of the cardiology unit of a hospital in a span of 12 months.

| S. No. | Department/Section    |
|--------|-----------------------|
| 1.     | Electrocardiography   |
| 2.     | TMT & Holter monitor  |
| 3.     | ECHO                  |
| 4.     | Cath Lab              |
| 5.     | Cardiac OT            |
| 6.     | ICU/CCU/Recovery Room |

#### Guidelines for Project work

1. During internship and project work, students will have to maintain a file.

In the file, collected data & diagnostic procedure (or surgery) of patients should be recorded.

#### 2. Project Work

On the given topic, student will collect the data of patients (as many as possible) and submit the project report before Viva Voce.

The project work will be taken up by a student on an area identified is the process of internship.

The assessment of the course will be done based on the following criteria:

- v. Attendances
- vi. Case Study
- vii. Report
- viii. Presentation

The report should base the following points:

- vii. Causes
- viii. Risk Factors
- ix. Prevalence
- x. Post Treatment Effects on Patients
- xi. Precautions Or Suggestions for Patients
- xii. Conclusive Remarks (by Presenter)

Note - During the internship period, student must attend all mentioned departments for the given time period.

**Clinical Training and internship:** Every student who has passed in all the theory and practical examinations of all the three years will have to undergo 1 year compulsory clinical training in at-least 250 bedded hospital as rotatory inter departmental internship as per schedule finalized by the School of Allied Health Sciences authorities. No candidate shall be permitted to proceed to the internship of the course of study i.e. clinical training in hospital, unless he/she has passed in all the written theory and practical examinations conducted during the preceding three years of the course of study. Every student should attend his/her training in the associated training hospital as per the timings of those centers. The candidate shall maintain a **log book** for all the events of the respective posting. Logbook completed by the student in that training Centre will have to be countersigned by the Faculty or In-charge of that Centre. The Regular participation of students in seminars / case presentations is mandatory and aimed to encourage them in learning research and development programs in Cardiovascular Technology. On completion of the training, the log book submitted by each candidate will be evaluated by authorities and declared to be 'Satisfactory' or 'Not Satisfactory'.