**SCHEME OF B.Sc. (HONS.) BIOTECHNOLOGY**

**UNDER CHOICE BASED CREDIT SYSREM**

**Session 2018-19, 2019-20, 2020-21**

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| --- | --- |
| **SEMESTER I** | **SEMESTER II** |
| CI-BHB1 | Biochemistry & Metabolism  | C3-BHB6 | Mammalian Physiology |
| C2-BHB2 | Cell Biology | C4-BHB7 | Plant Anatomy &Physiology  |
| AECCI-BHB3 | English-I | AECC3- BHB8 | English II |
| GE 1-BHB4 | Biostatistics /Developmental Biology/Chemistry-I | GE 2-BHB9 | Biotechnology & Human Welfare / Microbial physiology/Chemistry-2 |
| AECC2-BHB5 | Punjabi-I(Punjabi Qualifying) /Elementary Punjabi( Elementary Punjabi for Foreign candidates only)]  | AECC4-BHB10 | Punjabi-II (Punjabi Qualifying)/Elementary Punjabi( Elementary Punjabi for Foreign candidates only)]  |
| GE3-BHB11 | Drug Abuse: problem, Management and prevention **(Qualifying)** |

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| **SEMESTER III** | **SEMESTER IV** |
| C5-BHB12 | Genetics | C8-BHB17 | Molecular Biology |
| C6-BHB13 | General Microbiology | C9-BHB18 | Immunology |
| C7-BHB14 | Spectroscopic Techniques-I /Chemistry-3 | C10-BHB19 | Spectroscopic Techniques-II /Chemistry-4 |
| SEC I-BHB15 | Enzymology | SEC 2-BHB20 | Industrial Fermentations |
| GE 4-BHB16 | Environment Biotechnology/Ecology & Environment Management | GE 5-BHB21 | IPR, Entrepreneurship, Bioethics & Bio-safety/Entrepreneurship Development |
| AECC5-BHB22 | Environmental & Road safety Awareness **(Qualifying)** |

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| **SEMESTER V** | **SEMESTER VI** |
| C11-BHB23 | Bioprocess Technology | C13-BHB28 | Bio Analytical Tools |
| C12-BHB24 | Recombinant DNA Technology | C14-BHB29 | Genomics and Proteomics |
| DSE 1-BHB25 | Animal Biotechnology/Animal Diversity I | DSE 3-BHB30 | Medical Microbiology/Animal Diversity II/ |
| DSE 2-BHB26 | Plant Biotechnology/Plant Diversity I | DSE 4-BHB31 | Bioinformatics /Plant diversity II |
| GE-6-BHB27 | Basics of Forensic Science/Chemistry-5 | GE-7-BHB 32 | Food Biotechnology/Chemistry-6 |

**C:** Core Courses ; **GE:** Generic Elective; **AECC;** Ability Enhancement compulsory course

**SEC**; Skill Enhancement Course; **DSE**: Discipline specific Elective;

**BHB**: B.Sc.(Hons.) Biotechnology subject number code

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| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Semester I** | **Semester II** | **Semester III** | **Semester IV** | **Semester V** | **Semester VI** | **GRAND TOTAL** |
| **Total Marks** | 550 | 550 | 750 | 750 | 750 | 750 | **4100** |
| **Total Credits** | 20 | 20 | 30 | 30 | 30 | 30 | **160** |

**SUMMARY OF COURSES, MARKS AND CREDITS FOR COMPLETION**

 **B.SC.(HONS.) BIOTECHNOLOGY DEGREE**

**Total papers: 32; Core courses=14; Ability Enhancement Compulsory courses=5; Skill Enhancement Courses: 2; Discipline Specific Elective: 4; Generic Elective: 7; One month Industrial training/ hands on training for skill enhancement is compulsory for completion of this professional degree**

**B.Sc. (Hons.) Biotechnology**

**CHOICE BASED CREDIT SYSTEM**

**(Academic Session 2018-2019, 2019-20 & 2020-21**

**Scheme of Study**

**B.SC. (Hons.) Biotechnology Part I (1st Semester)**

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| --- |
| **SEMESTER I** |
| **Paper No. and code** | **Name of paper** | **Credit per Week** | **Internal Marks\*** | **External Marks** | **Total Marks** |
| C1-BHB1 | Biochemistry & Metabolism | 4 | 26 | 74 | 100 |
| C2-BHB2 | Cell Biology | 4 | 26 | 74 | 100 |
| AECC1-BHB3 | English-I | 2 | 25 | 75 | 100 |
| GE1-BHB4  | Biostatistics /Developmental Biology/chemistry-1 | 4 | 26 | 74 | 100 |
| AECC-2-BHB5 | Punjabi-I(Qualifying) | 2 lecture per week(non-credit) | 25\*\* | 75\*\* | 100\*\*(Satisfactory/unsatisfactory) |
|  LC-1(C1-BHB1) | Practical Pertaining to Theory Paper C1-BHB1 | 2 | --- | 50 | 50 |
| LC-2(C2-BHB2) | Practical Pertaining to Theory Paper C2-BHB2 | 2 | --- | 50 | 50 |
| LC-3 (GE1 -BHB4) | Practical Pertaining to Theory Paper-GE1-BHB4 | 2 | --- | 50 | 50 |
| **Total** |  | **20** | **103** | **447** | **550** |

**Note: \***Weight-age of different components in internal assessment is as: Attendance: 20%; written assignment/project work/Seminar/Industrial visit: 40%; two- mid semester Tests/Internal Examination- 40%

\*\* marks are not included in total marks.(qualifying paper)

 **B.Sc. (Hons.) Biotechnology**

**CHOICE BASED CREDIT SYSTEM**

**(Academic Session 2018-2019, 2019-20 & 2020-21**

**Subject and Distribution of Marks**

**B.SC. (Hons.) Biotechnology Part I (2nd Semester)**

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| **SEMESTER II** |
| **Paper No and code** | **Name of paper** | **Credit per Week** | **Internal Marks\*** | **External Marks** | **Total Marks** |
| C3-BHB6 | Mammalian Physiology | 4 | 26 | 74 | 100 |
| C4-BHB7 | Plant Anatomy & Physiology | 4 | 26 | 74 | 100 |
| AECC3-BHB8 | English-II | 2 | 25 | 75 | 100 |
| GE2-BHB9 | Biotech& Human Welfare/Microbial Physiology/Chemistry-2 | 4 | 26 | 74 | 100 |
| AECC4-BHB-10 | Punjabi-II (Qualifying) | 2 lecture per week(non-credit) | 25\*\* | 75\*\* | 100\*\*(Satisfactory/unsatisfactory) |
| GE3- BHB11 | Drug Abuse: problem, Management and Prevention\*\*(qualifying, marks not included) | 4 lectures per week(non credit) | 30\*\*\* | 70\*\*\* | 100\*\*\* |
| LC-4(C3-BHB6) | Practical Pertaining to Theory Paper-C3-BHB6 | 2 | --- | 50 | 50 |
| LC-5(C4-BHB7) | Practical Pertaining to Theory Paper-C4-BHB7 | 2 | --- | 50 | 50 |
| LC-6(GE2-BHB9) | Practical Pertaining to Theory Paper-GE2-BHB 9  | 2 | --- | 50 | 50 |
| **Total** |  | **20** | **103** | **447** | **550** |

**Note: \***Weight age of different components in internal assessment is as: Attendance: 20%; written assignment/project work/Seminar/Industrial visit: 40%; two- mid semester Tests/Internal Examination- 40%

\*\* marks are not included in total marks. (**Qualifying paper)**

\*\*\*marks of Drug Abuse: problem, Management and Prevention shall not be included. It is **qualifying.**

**B.Sc. (Hons.) Biotechnology Part II**

**CHOICE BASED CREDIT SYSTEM**

**(Academic Session 2018-2019, 2019-20 & 2020-21**

**Subject and Distribution of Marks**

**B.SC. (Hons.) Biotechnology Part II (3rd Semester)**

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| **SEMESTER III** |
| **Paper No and code** | **Name of paper** | **Credit per Week** | **Internal Marks\*** | **External Marks** | **Total Marks** |
| C5-BHB12 | Genetics | 4 | 26 | 74 | 100 |
| C6-BHB13 | General Microbiology | 4 | 26 | 74 | 100 |
| C7-BHB14 | Spectroscopic Techniques-I/ Chemistry-3 | 4 | 26 | 74 | 100 |
| SECI-BHB15 | Enzymology | 4 | 26 | 74 | 100 |
| GE4-BHB16 | Environmental Biotechnology/ Ecology & Environment Management | 4 | 26 | 74 | 100 |
| LC-7(C5-BHB12) | Practical Pertaining to Theory C5-BHB12 | 2 | --- | 50 | 50 |
| LC-8(C6-BHB13) | Practical Pertaining to Theory C6-BHB-13 | 2 | --- | 50 | 50 |
| LC-9(C7- BHB14) | Practical Pertaining to Theory C7-BHB-14 | 2 | --- | 50 | 50 |
| LC-10(SECI-BHB15) | Practical pertaining to theory SECI-BHB15 | 2 |  | 50 | 50 |
| LC-11(GE4-BHB16) | Practical pertaining to theory GE4-BHB16 | 2 |  | 50 | 50 |
| **Total** |  | **30** | **130** | **620** | **750** |

**Note: \***Weight age of different components in internal assessment is as: Attendance: 20%; written assignment/project work/Seminar/Industrial visit: 40%; two- mid semester Tests/Internal Examination- 40%

**B.Sc. (Hons.) Biotechnology Part II**

**CHOICE BASED CREDIT SYSTEM**

**(Academic Session 2018-2019, 2019-20 & 2020-21**

**Subject and Distribution of Marks**

**B.SC. (Hons.) Biotechnology part II (4th Semester)**

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| **SEMESTER IV** |
| **Paper No and code** | **Name of paper** | **Credit per Week** | **Internal Marks\*** | **External Marks** | **Total Marks** |
| C8-BHB17 | Molecular Biology | 4 | 26 | 74 | 100 |
| C9-BHB18 | Immunology | 4 | 26 | 74 | 100 |
| C10-BHB19 | Chemistry-4/Spectroscopic Techniques-II | 4 | 26 | 74 | 100 |
| SEC-2 BHB 20 | Industrial Fermentations | 4 | 26 | 74 | 100 |
| GE5- BHB 21 | IPR, Entrepreneurship Bioethics & Bio-safety/Entrepreneurship development | 4 | 26 | 74 | 100 |
| AECC-5-BHB 22 | Environmental & Road Safety Awareness(Qualifying/ as per university rules) | 2 lectures per week | 30 | 70 | 100\*\* |
| LC-12(C8-BHB17) | Practical Pertaining to (C8-BHB17) | 2 | --- | 50 | 50 |
| LC-13(C9-BHB18) | Practical Pertaining to Theory Paper (C9-BHB18 | 2 | --- | 50 | 50 |
| LC-14(C10-BHB 19) | Practical Pertaining to Theory Paper (C10-BHB19) | 2 | - | 50 | 50 |
| LC-15(SEC-2 BHB 20) | Practical Pertaining to Theory (SEC-2 BHB 20) | 2 | --- | 50 | 50 |
| LC-16(GE5 BHB 21) | Practical Pertaining to Theory GE5 BHB 21 | 2 |  | 50 | 50 |
| **Total** |  | **30** | **130** | **620** | **750** |

**Note: \***Weight age of different components in internal assessment is as: Attendance: 20%; written assignment/project work/Seminar/Industrial visit: 40%; two- mid semester Tests/Internal Examination- 40%

\*\*marks are not to be included in total marks of semester.

**B.Sc. (Hons.) Biotechnology PART III**

**CHOICE BASED CREDIT SYSTEM**

**(Academic Session 2018-2019, 2019-20 & 2020-21**

**Subject and Distribution of Marks**

**B.SC. (Hons.) Biotechnology part III (5th Semester)**

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| **SEMESTER V** |
| **Paper No and code** | **Name of paper** | **Credit per Week** | **Internal Marks\*** | **External Marks** | **Total Marks** |
| C11-BHB23 | Bioprocess Technology | 4 | 26 | 74 | 100 |
| C12-BHB24 | Recombinant DNA Technology | 4 | 26 | 74 | 100 |
| DSE-1-BHB 25 | Animal Biotechnology /Animal Diversity-I | 4 | 26 | 74 | 100 |
| DSE-2-BHB26 | Plant Biotechnology /Plant Diversity-I | 4 | 26 | 74 | 100 |
| GE-6-BHB27 | Basics of Forensic Science/Chemistry-5 | 4 | 26 | 74 | 100 |
| LC-17(C11-BHB23) | Practical Pertaining to Theory Paper-C11-BHB23 | 2 | --- | 50 | 50 |
| LC-18(C12-BHB24) | Practical Pertaining to Theory C12-BHB24 | 2 | --- | 50 | 50 |
| LC-19(DSE-1-BHB25) | Practical Pertaining to Theory Paper- DSE-1-BHB25 | 2 | --- | 50 | 50 |
| LC-20(DSE-2-BHB26) | Practical Pertaining to Theory Paper- DSE-2-BHB26 | 2 | --- | 50 | 50 |
| LC-21(GE-6-BHB27) | Practical pertaining to Theory Paper (GE-6-BHB27) | 2 |  | 50 | 50 |
| **Total** |  | **30** | **130** | **620** | **750** |

**\*Note:** Weight age of different components in internal assessment is as: Attendance: 20%; written assignment/project work/Seminar/Industrial visit: 40%; two- mid semester Tests/Internal Examination- 40%

**B.Sc. (Hons.) Biotechnology PART III**

**CHOICE BASED CREDIT SYSTEM**

**(Academic Session 2018-2019, 2019-20 & 2020-21**

**Subject and Distribution of Marks**

**B.SC. (Hons.) Biotechnology PART III (6th Semester)**

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| **SEMESTER VI** |
| **Paper No and code** | **Name of paper** | **Credit per Week** | **Internal Marks\*** | **External Marks** | **Total Marks** |
| C13-BHB28 | Bio Analytical Tools | 4 | 26 | 74 | 100 |
| C14-BHB29 | Genomics and Proteomics | 4 | 26 | 74 | 100 |
| DSE-3-BHB-30 | Medical Microbiology/Animal Diversity-II | 4 | 26 | 74 | 100 |
| DSE-4-BHB31 | Bioinformatics/Plant Diversity II/  | 4 | 26 | 74 | 100 |
| GE-7-BHB32 | Food Biotechnology/ Chemistry-6 | 4 | 26 | 74 | 100 |
| LC-22(C13-BHB28) | Practical Pertaining to Theory C13-BHB28 | 2 | --- | 50 | 50 |
| LC-23(C14-BHB29) | Practical Pertaining to Theory C14-BHB29 | 2 | --- | 50 | 50 |
| LC-24(DSE-3-BHB-30) | Practical Pertaining to Theory Paper DSE-3-BHB-30 |  2  | --- | 50 | 50 |
| LC-25 (DSE-4-BHB 31) | Practical Pertaining to Theory Paper DSE-4-BHB-31 | 2 | - | 50 | 50 |
| LC-26 (GE-7-BHB32) | Practical pertaining to (GE-7-BHB32) | 2 |  | 50 | 50 |
| **Total** |  | **30** | **130** | **620** | **750** |

**Note: \***Weight age of different components in internal assessment is as: Attendance: 20%; written assignment/project work/Seminar/Industrial visit: 40%; two- mid semester Tests/Internal Examination - 40%