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| |  | | --- | | **COMSATS University Islamabad Registrar Office, Principal Seat, Islamabad \*\*\*** | | **Scheme of Studies of Bachelor of Science in Electronics and Computing (BSEC) for Fall - 2024** | | |  | | --- | | **1. Minimum Duration:  4 Years (Eight Semesters)** | | **2. Offered both in Fall and Spring** | |  | |  | | **Note:**  **Common policies and procedures notified vide No. CUI-Reg/Notif-1794/23/1884, dated August 25, 2023 relating to Undergraduate Degree Programs approved by the Competent Authority and amended from time to time shall be applicable.** | | |  | | | |
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Major Discipline Courses** | | | | | | | | | |  | **Course Code** | **Course Title** | **Credit Hours** | **Co-requisite(s)** | **Prerequisite (s)** |  |  |  | | 1 | AIC354 | Machine Learning Fundamentals | 3(2, 1) |  |  |  |  |  | | 2 | CSC103 | Programing Fundamentals | 4(3, 1) |  |  |  |  |  | | 3 | CSC211 | Data Structures | 4(3, 1) |  | CSC241 |  |  |  | | 4 | CSC241 | Object Oriented Programming | 4(3, 1) |  | CSC101 |  |  |  | | 5 | CSC262 | Artificial Intelligence | 3(2, 1) |  |  |  |  |  | | 6 | EEE223 | Signals and Systems | 4(3, 1) |  |  |  |  |  | | 7 | EEE231 | Electronics-I | 4(3, 1) |  |  |  |  |  | | 8 | EEE232 | Electronics-II | 4(3, 1) |  | EEE231 |  |  |  | | 9 | EEE241 | Digital Logic Design | 4(3, 1) |  |  |  |  |  | | 10 | EEE324 | Digital Signal Processing | 4(3, 1) |  | EEE223 |  |  |  | | 11 | EEE325 | Control Systems | 4(3, 1) |  | EEE223 |  |  |  | | 12 | EEE342 | Microprocessor Systems and Interfacing | 4(3, 1) |  | EEE241 |  |  |  | | 13 | EEE351 | Principles of Communication Systems | 4(3, 1) |  | EEE223 |  |  |  | | 14 | EEE415 | Digital Image Processing | 4(3, 1) |  | EEE223 |  |  |  | | 15 | EEE446 | Real Time Embedded Systems | 4(3, 1) |  | EEE342 |  |  |  | | 16 | MTH263 | Probability Theory and Random Variables | 3(3, 0) |  |  |  |  |  | | 17 | PHY221 | Circuit Theory | 4(3, 1) |  |  |  |  |  | | 18 | PHY324 | Electromagnetic Theory | 3(3, 0) |  | PHY124 |  |  |  | | 19 | PHY344 | Digital Design | 4(3, 1) |  | EEE241 |  |  |  | |  | | | | | | | | | | **3 List of Interdisciplinary courses: (all four courses from the following list)** | | | | | | | | | |  | **Course Code** | **Course Title** | **Credit Hours** | **Co-requisite(s)** | **Prerequisite (s)** |  |  |  | | 20 | MTH101 | Calculus I | 3(3, 0) |  |  |  |  |  | | 21 | MTH102 | Calculus II | 3(3, 0) |  | MTH101 |  |  |  | |  | | | | | | | | | | **3. List of Interdisciplinary Courses (any four courses from the following list)** | | | | | | | | | |  | **Course Code** | **Course Title** | **Credit Hours** | **Co-requisite(s)** | **Prerequisite (s)** |  |  |  | | 22 | MTH231 | Linear Algebra | 3(3, 0) |  |  |  |  |  | | 23 | MTH241 | Ordinary Differential Equations | 3(3, 0) |  | MTH102 |  |  |  | |  | | | | | | | | | | **4. Field Experience/Internship** | | | | | | | | | |  | **Course Code** | **Course Title** | **Credit Hours** | **Co-requisite(s)** | **Prerequisite (s)** |  |  |  | | 24 | PHY398 | Field Experience/Internship | 3(0, 3) |  |  |  |  |  | |  | | | | | | | | | | **5 Capstone project** | | | | | | | | | |  | **Course Code** | **Course Title** | **Credit Hours** | **Co-requisite(s)** | **Prerequisite (s)** |  |  |  | | 25 | PHY498 | Capstone Project I | 3(0, 3) |  | EEE223 ,EEE241 |  |  |  | | 26 | PHY498 | Capstone Project II | 3(0, 3) |  | PHY498 |  |  |  | |  | | | | | | | | | | **Application of Information and Communication Technologies (Mandatory course) :** | | | | | | | | | |  | **Course Code** | **Course Title** | **Credit Hours** | **Co-requisite(s)** | **Prerequisite (s)** |  |  |  | | 27 | CSC101 | Applications of Information and Communication Technologies | 3(2, 1) |  |  |  |  |  | |  | | | | | | | | | | **Arts and Humanities (any one Course from the following list) :** | | | | | | | | | |  | **Course Code** | **Course Title** | **Credit Hours** | **Co-requisite(s)** | **Prerequisite (s)** |  |  |  | | 28 | HUM123 | Fundamentals of Philosophy | 2(2, 0) |  |  |  |  |  | | 29 | HUM430 | French | 2(2, 0) |  |  |  |  |  | | 30 | HUM431 | German | 2(2, 0) |  |  |  |  |  | | 31 | HUM432 | Arabic | 2(2, 0) |  |  |  |  |  | | 32 | HUM434 | Chinese | 2(2, 0) |  |  |  |  |  | |  | | | | | | | | | | **Civics and Community Engagement (Mandatory course) :** | | | | | | | | | |  | **Course Code** | **Course Title** | **Credit Hours** | **Co-requisite(s)** | **Prerequisite (s)** |  |  |  | | 33 | HUM208 | Civics and Community Engagement | 2(2, 0) |  |  |  |  |  | |  | | | | | | | | | | **Elective Courses (any Five) /** | | | | | | | | | |  | **Course Code** | **Course Title** | **Credit Hours** | **Co-requisite(s)** | **Prerequisite (s)** |  |  |  | | 34 | AIC365 | Natural Language Processing | 3(2, 1) |  | CSC262 |  |  |  | | 35 | AIC380 | Artificial Neural Networks and Deep Learning | 3(2, 1) |  | CSC262 |  |  |  | | 36 | CSC270 | Database Systems | 4(3, 1) |  | CSC211 |  |  |  | | 37 | CSC336 | Web Technologies | 3(2, 1) |  |  |  |  |  | | 38 | EEE353 | Digital Communication Systems | 4(3, 1) |  | EEE351 |  |  |  | | 39 | EEE371 | Electric Machines | 4(3, 1) |  | PHY324 |  |  |  | | 40 | EEE447 | Robotics | 3(3, 0) |  | EEE325 |  |  |  | | 41 | EEE455 | Optical Fiber Communications | 3(3, 0) |  | EEE351 |  |  |  | | 42 | EEE463 | Antenna and Radio Wave Propagation | 4(3, 1) |  | PHY324 |  |  |  | | 43 | EEE464 | Wireless Communication Systems | 3(3, 0) |  | EEE351 |  |  |  | | 44 | EEE465 | Microwave and Satellite Communication Systems | 3(3, 0) |  | EEE463 |  |  |  | | 45 | PHY346 | Data Communication and Networks | 3(3, 0) |  | EEE351 |  |  |  | | 46 | PHY347 | Signal Processing Applications | 3(3, 0) |  | EEE324 |  |  |  | | 47 | PHY348 | Control System Design | 3(3, 0) |  | EEE325 |  |  |  | | 48 | PHY434 | VLSI Design | 4(3, 1) |  | EEE241 |  |  |  | | 49 | PHY461 | Industrial Automation | 3(3, 0) |  | PHY221 |  |  |  | |  | | | | | | | | | | **Entrepreneurship (Mandatory course) :** | | | | | | | | | |  | **Course Code** | **Course Title** | **Credit Hours** | **Co-requisite(s)** | **Prerequisite (s)** |  |  |  | | 50 | MGT250 | Introduction to Entrepreneurship | 2(2, 0) |  |  |  |  |  | |  | | | | | | | | | | **Expository Writing (any one course from the following list)** | | | | | | | | | |  | **Course Code** | **Course Title** | **Credit Hours** | **Co-requisite(s)** | **Prerequisite (s)** |  |  |  | | 51 | HUM102 | Report Writing Skills | 3(3, 0) |  | HUM104 |  |  |  | | 52 | HUM120 | Expository Writing | 3(3, 0) |  |  |  |  |  | |  | | | | | | | | | | **Functional English (Mandatory Course) :** | | | | | | | | | |  | **Course Code** | **Course Title** | **Credit Hours** | **Co-requisite(s)** | **Prerequisite (s)** |  |  |  | | 53 | HUM104 | Functional English | 3(3, 0) |  |  |  |  |  | |  | | | | | | | | | | **Ideology and Constitution of Pakistan (Mandatory course) :** | | | | | | | | | |  | **Course Code** | **Course Title** | **Credit Hours** | **Co-requisite(s)** | **Prerequisite (s)** |  |  |  | | 54 | HUM113 | Ideology and Constitution of Pakistan | 2(2, 0) |  |  |  |  |  | |  | | | | | | | | | | **Islamic Studies (Mandatory course. HUM116 Ethics 2(2, 0) is only for Non-Muslims Students) /** | | | | | | | | | |  | **Course Code** | **Course Title** | **Credit Hours** | **Co-requisite(s)** | **Prerequisite (s)** |  |  |  | | 55 | HUM112 | Islamic Studies | 2(2, 0) |  |  |  |  |  | | 56 | HUM116 | Ethics | 2(2, 0) |  |  |  |  |  | |  | | | | | | | | | | **List of Minor(s) offered by the Department: i. Electronics and Computing (Industrial Automation)** | | | | | | | | | |  | **Course Code** | **Course Title** | **Credit Hours** | **Co-requisite(s)** | **Prerequisite (s)** |  |  |  | | 57 | EEE223 | Signals and Systems | 4(3, 1) |  |  |  |  |  | | 58 | EEE325 | Control Systems | 4(3, 1) |  |  |  |  |  | | 59 | EEE342 | Microprocessor Systems and Interfacing | 4(3, 1) |  |  |  |  |  | | 60 | PHY461 | Industrial Automation | 3(3, 0) |  |  |  |  |  | |  | | | | | | | | | | **List of Minor(s) offered by the Department: ii. Electronics and Computing (Embedded Systems)** | | | | | | | | | |  | **Course Code** | **Course Title** | **Credit Hours** | **Co-requisite(s)** | **Prerequisite (s)** |  |  |  | | 61 | EEE231 | Electronics-I | 4(3, 1) |  |  |  |  |  | | 62 | EEE342 | Microprocessor Systems and Interfacing | 4(3, 1) |  |  |  |  |  | | 63 | EEE446 | Real Time Embedded Systems | 4(3, 1) |  |  |  |  |  | | 64 | PHY344 | Digital Design | 4(3, 1) |  |  |  |  |  | |  | | | | | | | | | | **List of Minor(s) offered by the Department: iii. Electronics and Computing (Communications)** | | | | | | | | | |  | **Course Code** | **Course Title** | **Credit Hours** | **Co-requisite(s)** | **Prerequisite (s)** |  |  |  | | 65 | EEE223 | Signals and Systems | 4(3, 1) |  |  |  |  |  | | 66 | EEE351 | Principles of Communication Systems | 4(3, 1) |  |  |  |  |  | | 67 | EEE353 | Digital Communication Systems | 4(3, 1) |  |  |  |  |  | | 68 | EEE464 | Wireless Communication Systems | 3(3, 0) |  |  |  |  |  | |  | | | | | | | | | | **Natural Sciences (Mandatory Courses) /** | | | | | | | | | |  | **Course Code** | **Course Title** | **Credit Hours** | **Co-requisite(s)** | **Prerequisite (s)** |  |  |  | | 69 | PHY124 | Applied Physics | 3(2, 1) |  |  |  |  |  | |  | | | | | | | | | | **Non-Credit Course** | | | | | | | | | |  | **Course Code** | **Course Title** | **Credit Hours** | **Co-requisite(s)** | **Prerequisite (s)** |  |  |  | | 70 | MTH001 | Basic Mathematics | 0(0, 0) |  |  |  |  |  | |  | | | | | | | | | | **Quantitative Reasoning (Mandatory courses) /** | | | | | | | | | |  | **Course Code** | **Course Title** | **Credit Hours** | **Co-requisite(s)** | **Prerequisite (s)** |  |  |  | | 71 | MTH103 | Exploring Quantitative Skills | 3(3, 0) |  |  |  |  |  | | 72 | MTH114 | Tools for Quantitative Reasoning | 3(3, 0) |  | MTH103 |  |  |  | |  | | | | | | | | | | **Social Science (Mandatory Course) /** | | | | | | | | | |  | **Course Code** | **Course Title** | **Credit Hours** | **Co-requisite(s)** | **Prerequisite (s)** |  |  |  | | 73 | HUM122 | Fundamentals of Psychology | 2(2, 0) |  |  |  |  |  | |

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| **Note:** | | |
| 1.Natural Sciences (1 course, 3 credit hours - 2 theory credit hours + 1 lab credit hour): This course falls under the Natural Sciences category and carries 3 credit hours. It usually consists of 2 credit hours of theory and 1 credit hour of laboratory work. The course may cover subjects like biology, chemistry, physics, or environmental sciences. 2. Social Sciences (1 course, 2 credit hours): This course is categorized under Social Sciences and carries 2 credit hours. It may include subjects like sociology, psychology, anthropology, economics, or political science. 3. Functional English (1 course, 3 credit hours): The Functional English course is designed to improve students' practical language skills and carries 3 credit hours. 4. Expository Writing (1 course, 3 credit hours): Expository Writing aims to enhance students' writing abilities, particularly in producing clear and informative essays. The course carries 3 credit hours. 5. Quantitative Reasoning (2 courses, 6 credit hours): This category consists of two courses, each carrying 3 credit hours, focusing on developing students' quantitative and mathematical reasoning skills. 6. Islamic Studies (OR) Religious Education/Ethics for non-Muslim students (1 course, 2 credit hours): This course covers Islamic Studies for Muslim students. Alternatively, non-Muslim students can take Religious Education or Ethics instead. The course carries 2 credit hours. 7. Ideology and Constitution of Pakistan (1 course, 2 credit hours): This course explores the ideology and constitution of Pakistan and carries 2 credit hours. 8. Applications of Information and Communication Technologies (ICT) (1 course, 3 credit hours - 2 theory hours + 1 lab hour): This course focuses on the practical applications of ICT and carries 3 credit hours, with 2 hours dedicated to theory and 1 hour to lab work. 9. Entrepreneurship (1 course, 2 credit hours): This course aims to teach students about entrepreneurship and carries 2 credit hours. 10. Civics and Community Engagement (1 course, 2 credit hours): This course covers civics and community engagement topics and carries 2 credit hours.  **Associate Degree:** 11. Exiting from Undergraduate/Equivalent Degree Program with an Associate Degree: In the undergraduate/equivalent degree program, students have the option to exit and obtain an Associate Degree if they meet specific criteria. To qualify, students must have completed at least 60 credit hours, including 30 credit hours of general education courses, over a minimum of four semesters, while maintaining a minimum CGPA of 2.00/4.00. The subject field on the degree must remain the same as initially enrolled, and approval for the exit option is granted by the Rector based on the Head of the Department's recommendations. However, this option is not available for disciplines accredited by certain councils like PM&DC, PNC, PVMC, PEC, PCP, PCATP, PBC, NTC, NCT, NAEAC, NCH, etc. On the other hand, disciplines accredited by councils such as NCEAC, NBEAC, and NACTE allow students to pursue the Associate Degree option. 12. Credit Hours: To qualify for the Associate Degree, the standard range of credit hours is 60-72. 13. General Education Courses: All Associate Degree programs must include a mandatory set of 30 credit hours for general education courses. 14. Major Courses: Associate Degree programs shall consist of a mandatory set of 30-42 credit hours for major or disciplinary courses. 15. Field Experience/Internship: If prescribed by the respective Accreditation Council, National Curriculum Review Committee, or the university, a field experience or internship of six to eight weeks must be completed and graded by a faculty member in collaboration with the field supervisor appointed by HoD. This requirement carries 3 credit hours, and if applicable, the courses within the major will comprise 30-39 credit hours. 16. CGPA Requirement: The minimum CGPA required for the award of the Associate Degree program is 2.00/4.00. 17. The pathway for Associate Degree holders allows direct admission to the fifth semester in the same discipline without deficiency courses. However, if the disciplines differ, students must complete deficiency courses in a bridging semester before the fifth semester, as determined by the university's concerned department.Short-listed candidates will undergo a deficiency semester to complete required courses in the relevant discipline before entering the 5th semester of their respective BS programs at CUI. The deficiency courses will be determined by the Dean, recommended by the HoD and Chairman, based on the students' profiles. The relevancy of the previous degree will also be determined by the respective Dean,recommended by the HoD and Chairman on a case-by-case basis, and the decision will be notified and documented in the student's file by the respective campus registrar office. Candidates will also be informed by the respective campus registrar office about their deficiency course/semester before the start of the semester. The minimum eligibility for admission to the fifth semester is a CGPA of 2.00/4.00 or 1st Division in the prior qualification, i.e., the Associate Degree. They are also required to submit NTS-NAT test scores as per CUI policy. All other terms and conditions of CUI, as well as those of relevant Accreditation Councils/Professional Bodies, if any, apply as amended from time to time. 18. Pathway for Conventional Two-Year BA/BSc/Equivalent Degree Holders: Students who completed conventional two-year BA/BSc/equivalent degree programs can join the fifth semester of an undergraduate/equivalent degree program. However, they need to complete deficiency courses through a bridging semester before starting the fifth semester, as determined by the university. The minimum eligibility for admission to the fifth semester in this case is 50% marks in the prior qualification, i.e., conventional two-year BA/BSc/equivalent degree programs. They are also required to submit NTS-NAT test scores as per CUI policy. All other terms and conditions of CUI, as well as those of relevant Accreditation Councils/Professional Bodies, if any, apply as amended from time to time. | | |
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