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|  | **Bangladesh Army University of Engineering & Technology**  Qadirabad Cantonment, Natore-6431  Faculty of Electrical and Computer Engineering  **Department of Electrical and Electronic Engineering** |

Course Plan

**EEE 3100: Integrated Design Project I/II**

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| **Program:** | Electrical and Electronic Engineering (EEE) |
| **Course Code & Title:** | EEE 3100 - Integrated Design Project I |
| **Semester:** | Fall 2023 |
| **Year:** | 3rd Year 1st Semester |
| **Credit Hour:** | 1.00 (2.00 Hrs./Week) |
| **Training Duration** | 6 Months (1 semesters) |
| **Rationale:** | To integrate the different design components covered in different fundamental courses. Engineering education facilitates a developmental journey that learners take in order to prepare themselves for a professional career. This course aims to equip students well enough to undertake real life design problems in their 3rd year of study. |
| **Pre-requisite (if any):** | None |

1. **Course Contents**

This course is the first part to capstone project. The course aims to synergies all the basic engineering knowledge gained previously to solve real electrical engineering problems in an integrated and comprehensive manner. Students will be first exposed to the importance of good design concepts that considers important characteristics considering public health and safety, society and culture, environment and sustainability, authorities’ requirements, as well as project cost effectiveness. Students will work in groups to observe existing project to evaluate the pros and cons of project characteristics. Electrical engineering is an engineering stream that comprises study and understanding about electricity and electronics. The main work of electrical engineers is to distribute energy for different devices. They have to use their knowledge and skills of electrical engineering for solving various technical problems. Students will be capable of doing on some specified electrical devices or products like developing Embedded systems; designing power generating and transmitting system like a power plant of a wind farmhouse, and so on. Preparation and presentation of report will be done at the end of the course by the students.

1. **Statement of Course Outcome and Mapping**

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| CO No | CO Statement | PO | BL | K | P | A | Delivery  M & A | Assessment Tools |
| CO1 | **Design solutions** of complex engineering problem that meet specified needs with appropriate consideration for public health and safety, culture, societal and environmental considerations. | PO3 | C6 | K5 | P1 P3 P7 | - | Demonstration  Tutorial  Group work  Simulation  Lab Work | Report |
| CO2 | **Conduct investigations** of complex problems (using research-based knowledge (K8) and research methods) to provide valid conclusions. | PO4 | P3 | K8 | P1 P2  P4 |  | Demonstration  Tutorial  Group work | Report |
| CO3 | **Create relevant resources** for complex engineering problems using modern engineering tools. | PO5 | P4 | K6 | P1  P3  P5 |  | Tutorial  Group work  Simulation  Lab Work | Project Show |
| CO4 | **Design solution** for complex engineering problem in accordance with professional practices. | PO6 | A3 | K7 | P1  P6 |  | Tutorial  Group work  Simulation  Lab Work | Project Show |
| CO5 | **Demonstrates professional ethics** and norms of engineering practices. | PO8 | A3 |  |  |  | Demonstration | Report  (Checking Plagiarism) |
| CO6 | **Perform** effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings. | PO9 | A3 |  |  |  | Demonstration  Tutorial  Group work | Progress Presentation/Final Defense, Viva |
| CO7 | **Perform effective oral presentation** on complex engineering activities showing some definite involvement or commitment. | PO10 | A3 |  |  | A1-  A5 | Demonstration  Tutorial  Group work | Oral Presentation  (In final defense) |
| CO8 | **Apply engineering management** principles and economic decision making to solve engineering projects as a Team/Individual. | PO11 | C4 |  |  |  | Demonstration  Tutorial  Group work | Report  (Millstone Evaluation) |
| CO9 | **Develop** the ability to engage in independent learning of new things for project development. | PO12 | A4 |  |  |  | Demonstration  Tutorial  Group work | Report |

1. **Mapping of Course Outcomes (CO) and Program Outcomes (PO) with Level:**

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| CO NO | Program Outcome (PO) | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| CO1 |  |  | H |  |  |  |  |  |  |  |  |  |
| CO2 |  |  |  | H |  |  |  |  |  |  |  |  |
| CO3 |  |  |  |  | H |  |  |  |  |  |  |  |
| CO4 |  |  |  |  |  | H |  |  |  |  |  |  |
| CO5 |  |  |  |  |  |  |  | L |  |  |  |  |
| CO6 |  |  |  |  |  |  |  |  | L |  |  |  |
| CO7 |  |  |  |  |  |  |  |  |  | M |  |  |
| CO8 |  |  |  |  |  |  |  |  |  |  | L |  |
| CO9 |  |  |  |  |  |  |  |  |  |  |  | L |

High (H)=3, Medium (M)=2 and Low (L)=1

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| Program Outcomes  (PO) | | | | | | | | | | | | Knowledge Profile  (KP/K) | | | | | | | | Complex Engineering Problem (CEP/P) | | | | | | | Engineering Activities (A) | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | K1 | K2 | K3 | K4 | K5 | K6 | K7 | K8 | P1 | P2 | P3 | P4 | P5 | P6 | P7 | A1 | A2 | A3 | A4 | A5 |
|  |  | C6 | P3 | P4 | A3 |  | A3 | A3 | A3 | C4 | A4 |  |  | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |

1. **Assessment Strategy:**

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| Si | Assessment Tools | Marks | Time Line |
| 1 | Proposal Submission | 5% | 1st Week |
| 2 | Progress Presentation | 15% | 8th Week (After Mid Sem) |
| 3 | Report Writing | 30% | 14th Week (Submission) |
| 4 | Project show | 30% | Next Week of Sem. Final |
| 5 | Final Defense | 20% | Next Week of Sem. Final |
| Total | | 100% |  |

* 1. **Details Marks Distribution of Report Writing**

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| PO | CO | Level | Blooms Tax. Level | Assessment Tools | Percentage (30%) |
| PO3 | CO1 | H | C6 **Creating/Designing** | Report (Project Design) | 10% |
| PO4 | CO2 | H | P3 **Precision** | Report (Literature Review and Methodological Investigation) | 5% |
| PO5  PO12 | CO3  CO9 | H  L | P4 **Articulation**  A4 **Organize** | Report (Create/Use of Relevant Tools) | 5% |
| PO8 | CO5 | L | A3 **Value** | Report (Checking Plagiarism) | 5% |
| PO11 | CO8 | L | C4 **Analyzing** | Report (Millstone Evaluation) | 5% |

* 1. **Details Marks Distribution of Project Show**

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| PO | CO | Level | Blooms Tax. Level | Assessment Tools | Percentage (30%) |
| PO6 | CO4 | H | A3 **Value** | Project Design (Professional Practice) | 20% |
| PO5  PO12 | CO3  CO9 | H  L | P4 **Articulation**  A4 **Organize** | Project Show (Learned and used relevant modern tools) | 10% |

# Detail Lecture Plan:

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| **Description** | **Lecture Hour** |
| **Week: 01**  **Lecture 1: Introduction to Integrated Design Project**  Topics: 1. Overview of Integrated Design Projects  2. Importance of Interdisciplinary Approaches  3. Introduction to Research Literature in Design  Description: This lecture sets the foundation by introducing students to the concept of integrated design projects, highlighting the need for interdisciplinary collaboration. It also emphasizes the role of research literature in informing design decisions. | 2 |
| **Week: 02**  **Lecture 2: Research Literature Review**  Topics: 1. Defining the Research Problem  2. Conducting a Literature Review  3. Identifying Key Concepts and Theories  Description: Focus on understanding the research problem, guiding students through the process of conducting a literature review. Emphasize the importance of identifying relevant concepts and theories to inform the design process. | 2 |
| **Week: 03**  **Lecture 3: Design Thinking and Ideation**  Topics: 1. Introduction to Design Thinking  2. Ideation Techniques and Tools  3. Prototyping and Iterative Design  Description: Explore the principles of design thinking and provide practical tools for ideation. Discuss the iterative design process and the role of prototypes in refining ideas. | 2 |
| **Week-04:**  **Lecture 4: Methodology in Integrated Design**  Topics: 1. Choosing Research Methods  2. Integrating Qualitative and Quantitative Approaches  3. Case Studies and Fieldwork  Description: Examine different research methods suitable for integrated design projects. Discuss the integration of qualitative and quantitative approaches and the importance of case studies and fieldwork. | 2 |
| **Week-05:**  **Lecture 5: Collecting and Analyzing Data**  Topics: 1. Data Collection Techniques  2. Data Analysis Methods  3. Interpreting Findings  Description: Cover practical aspects of collecting and analyzing data relevant to integrated design projects. Discuss techniques for effective interpretation of findings. | 2 |
| **Week-06:**  **Lecture 6: Results and Findings Presentation**  Topics: 1. Communicating Results Effectively  2. Visualization Techniques  3. Presenting to Stakeholders  Description: Guide students on how to present their results in a clear and compelling manner. Emphasize the use of visualization techniques and effective communication with stakeholders. | 2 |
| **Week-07:**  **Lecture 7: Decision-Making in Design Projects**  Topics: 1. Decision Criteria and Frameworks  2. Stakeholder Involvement  3. Balancing Trade-offs  Description: Discuss decision-making processes in design projects, covering criteria and frameworks. Emphasize the importance of stakeholder involvement and the challenge of balancing trade-offs. | 2 |
| **Week-08:**  **Lecture 8: Final Project Presentations and Feedback**  Topics: 1. Guidelines for Final Presentations  2. Peer Feedback and Evaluation  3. Reflection on the Design Process  Description: Prepare students for their final project presentations. Discuss the importance of constructive peer feedback and encourage reflection on the entire design process. | 2 |

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| **Prepared by:** |  | **Approved by: (Head of the Dept.)** |