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|  | **East West University**  **Department of Computer Science and Engineering**  **Course Outline**  **Spring 2020 Semester** |  |

**Course: CSE106 (2, 3), CSE205 (1) Discrete Mathematics**

**Course Site: https://yeasirrayhanprince.github.io/teaching/cse106-spring-2020**

**Credits and Teaching Scheme**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Theory | Laboratory | Total |
| Credits | 3 | 0 | 3 |
| Contact Hours | 3 Hours/Week for 13 Weeks + Final Exam in the 14th Week |  | 3 Hours/Week for 13 Weeks + Final Exam in the 14th Week |

**Prerequisite**

CSE103 Structured Programming

**Instructor Information**

**Instructor**: Yeasir Rayhan

Lecturer, Department of Computer Science and Engineering

**Office**: Room: AB2: 201

**Tel. No.**: 09666775577 (hunting) ext. 519

**E-mail**: [yrp111@ewubd.edu](mailto:yrp111@ewubd.edu)

**Contact:** 01793167491

**Class Routine and Office Hour**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Day** | **08:30-10:00** | **10:10-11:40** | **11:50-01:20** | **01:30-03:00** | **03:10-04:40** |
| **Sunday** | CSE103(10)  AB2 205 | CSE103(10)  637 | | CSE106(3)  AB2 403 | Office Hour |
| **Monday** | CSE106(1)  AB2 503 | CSE103(12)  630 | |  |  |
| **Tuesday** |  |  | Office Hour | Office Hour | CSE103(12)  AB1 601 |
| **Wednesday** | CSE106(1)  AB2 503 | Office Hour |  |  |  |
| **Thursday** | CSE 103(10)  AB2 205 | Office Hour | Office Hour | CSE106(3)  AB2 504 | CSE103(12)  AB1 601 |

**Course Objective**

This course builds up the students’ ability to think and express logically and mathematically. The course will address mathematical reasoning, combinatorial analysis, algorithmic thinking, and discrete structures. Knowledge of this course will be needed as prerequisite knowledge for future courses such as CSE110 Objected Oriented Programming, CSE207 Data Structures, CSE246 Algorithms, CSE302 Database Systems, CSE366 Artificial Intelligence, CSE405 Computer Networks, and CSE471 Compiler Design.

**Knowledge Profile**

K2: Conceptually-based mathematics, numerical analysis, statistics, and formal aspects of computer and information science

**Learning Domains**

Cognitive - C2: Understanding, C3: Applying

Psychomotor - P3: Precision

Affective - A2: Responding

**Program Outcomes (POs)**

PO1: Engineering Knowledge

**Complex Engineering Problem Solution**

None

**Complex Engineering Activities**

None

**Course Outcomes (COs) with Mappings**

After completion of this course students will be able to:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CO** | **CO Description** | **PO** | **Learning Domains** | **Knowledge Profile** | **Complex Engineering Problem Solving/ Engineering Activities** |
| CO1 | **Interpret** and **apply** propositional logic, predicate logic, and theorem proving for mathematical reasoning. | PO1 | C2, C3 | K2 | - |
| CO2 | **Interpret** and **apply** counting principles for combinatorial analysis. | PO1 | C2, C3 | K2 | - |
| CO3 | **Interpret** and **apply** the growth of functions, complexity analysis of algorithms, and integer algorithms for algorithmic thinking; **demonstrate** this knowledge and **write** report for realistic problem solving. | PO1 | C2, C3  P3  A2 | K2 | - |
| CO4 | **Interpret** and **apply** discrete structures such as sets, functions, relations, graphs, and trees for modeling discrete objects; **demonstrate** this knowledge and **write** report for realistic problem solving. | PO1 | C2, C3  P3  A2 | K2 | - |

**Course Topics, Teaching-Learning Method, and Assessment Scheme**

| **Course Topic** | **Teaching-Learning Method** | **CO** | **Mark of Cognitive Learning Levels** | | **CO Mark** | **Exam (Mark)** |
| --- | --- | --- | --- | --- | --- | --- |
| **C2** | **C3** |
| Propositional Logic, Propositional Equivalences, Predicates and Quantifiers, Nested Quantifiers | Lectures and discussions inside and outside the class | CO1 | 8 | 8 | 16 | Midterm Exam I  (25) |
| Introduction to Proofs, Mathematical Induction | Do | CO1 |  | 9 | 9 |
| Sets, Set Operations, Functions, Recursive Functions, Relations and Their Properties | Do | CO4 | 8 | 8 | 16 | Midterm Exam II  (25) |
| The Basics of Counting, The Pigeonhole Principle | Do | CO2 | 3 | 6 | 9 |
| Algorithms, The Growth of Functions, Complexity of Algorithms, The Integers and Division, Primes, Greatest Common Divisor, Least Common Multiplier | Do | CO3 | 4 | 8 | 12 | Final  (25) |
| Graphs, Graph Terminologies and Special Types of Graphs, Representing Graphs, Introduction to Trees | Do | CO4 | 6 | 7 | 13 |

**Mini Projects**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Mini Project** | **Teaching-Learning Method** | **CO** | **Mark of Cognitive Learning Level** | **Mark of Psycho-motor Learning Level** | **Mark of Affective Learning Level** | **CO Mark** | **Exam (Mark)** |
| **C3** | **P3** | **A2** |  |  |
| Mini Project with reports and presentation | Group-based or Individual, moderately complex programming projects with report writing and presentation | CO3  CO4 | 4  4 | 0.5  0.5 | 0.5  0.5 | 5  5 | Mini Project  (10) |
|  |  | Total | 8 | 1 | 1 | 10 |  |

**Overall Assessment Scheme**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Assessment Area** | **CO** | | | | **Other** | **PO Marks** |
| **CO1** | **CO2** | **CO3** | **CO4** |  | **PO1** |
| Class Participation |  |  |  |  | 5 |  |
| Class Test/Quiz |  |  |  |  | 10 |  |
| Midterm Exam - I | 25 | 0 | 0 | 0 |  | 25 |
| Midterm Exam -II | 0 | 9 | 0 | 16 |  | 25 |
| Final Exam | 0 | 0 | 12 | 13 |  | 25 |
| Mini Projects with report and presentation | 0 | 0 | 5 | 5 |  | 10 |
| **Total Mark** | **25** | **9** | **17** | **34** | **15** | **85** |

**Teaching Materials/Equipment**

**Text book:**

Kenneth H. Rosen, *Discrete Mathematics and Its Applications with Combinatorics and Graph Theory*, 7th Edition, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2015.

**Mini Projects:**

Mini Project description will be provided.

**Grading System**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Marks (%)** | **Letter Grade** | **Grade Point** | **Marks (%)** | **Letter Grade** | **Grade Point** |
| 97-100 | A+ | 4.00 | 73-76 | C+ | 2.30 |
| 90-96 | A | 4.00 | 70-72 | C | 2.00 |
| 87-89 | A- | 3.70 | 67-69 | C- | 1.70 |
| 83-86 | B+ | 3.30 | 63-66 | D+ | 1.30 |
| 80-82 | B | 3.00 | 60-62 | D | 1.00 |
| 77-79 | B- | 2.70 | Below 60 | F | 0.00 |

**Exam Dates**

|  |  |  |  |
| --- | --- | --- | --- |
| **Section** | **Term I** | **Term II** | **Final** |
| 1(205), 2(106) | 6 February | 12 March | 16 April |
| 3(106) | 5 February | 11 March | 13 April |

**Academic Code of Conduct**

**Academic Integrity:**

Any form of cheating, plagiarism, personification, falsification of a document as well as any other form of dishonest behavior related to obtaining academic gain or the avoidance of evaluative exercises committed by a student is an academic offence under the Academic Code of Conduct and **may lead to severe penalties as decided by the Disciplinary Committee of the university.**

**Special Instructions:**

* Students are expected to attend all classes and examinations. A student MUST have at least 80% class attendance to sit for the final exam.
* Students will not be allowed to enter into the classroom after 20 minutes of the starting time.
* For plagiarism, the grade will automatically become zero for that exam/assignment.
* Normally there will be **NO make-up exam**. However, in case of **severe illness, death of any family member, any family emergency, or any humanitarian ground**, if a student miss any exam, the student MUST get approval of makeup exam by written application to the Chairperson through the Course Instructor **within 48hours**of the exam time. Proper supporting documents in favor of the reason of missing the exam have to be presented with the application.
* For **final exam**, there will be NO makeup exam. However, in case of **severe illness, death of any family member, any family emergency, or any humanitarian ground**, if a student miss the final exam, the student MUST get approval of **Incomplete Grade** by written application to the Chairperson through the Course Instructor **within 48 hours** of the final exam time. Proper supporting documents in favor of the reason of missing the final exam have to be presented with the application. **It is the responsibility of the student to arrange an Incomplete Exam within the deadline mentioned in the Academic Calendar in consultation with the Course Instructor**.
* All mobile phones MUST be turned to silent mode during class and exam period.
* There is **zero tolerance for cheating** in exam. Students caught with cheat sheets in their possession, whether used or not; writing on the palm of hand, back of calculators, chairs or nearby walls; copying from cheat sheets or other cheat sources; copying from other examinee, etc. would be treated as cheating in the exam hall. The only penalty for cheating is **expulsion for several semesters as decided by the Disciplinary Committee of the university**.