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| **Course Name: Introduction to Artificial Intelligence** | | |
| **Course Code: COMP 360** | **Course Type (major)** | **Course Credits: 3 (2+1)** |
| **Class Timings:**  **On Empower** | **Section: A,B** | **Student Meeting Hours/ Office Hours:**  WR 1100-1400 |
| **Instructor Name: Dr. Aasia Khanum** | | |
| **A Note from the Instructor:**   * All lectures and related material will be uploaded on Moodle weekly. * Assignments / homeworks will be uploaded on Moodle and students will submit them using same. * All emails regarding the course should be sent through official FCC student email account and should have subject line starting as “COMP360-A “ or “COMP360-B“ as applicable. | | |
| **Instructor Contact Details**  Email: aasiakhanum@fccollege.edu.pk  Guidelines for contacting instructor: Office hours are mentioned above; you can request appointment for some other day via email | | |
| **Course Description**:  An introductory course of AI techniques for students who have not previously had an exposure to this subject  Pre-requisites if any: Data Structures, Stats  (Exposure to calculus, linear algebra and probability a plus) | | |
| **Main Mode of Instruction:** in person, Moodle and Zoom (online only in case of emergency situation)  **Technology Requirements** *Check Moodle on daily basis, Internet is required to access material*  **Considerations for Students with Limited Internet/Technology Access:** you need to inform in prior about limited access to internet to instructor**.** | | |
| **Course Objectives or** [**Student Learning Outcomes**](https://docs.google.com/document/d/1me9vpl8iKR_zNX9gIODm7gkVFY9VkuSKpUJe1VyI57M/edit) **(SLOs)**   1. Demonstrate awareness and a fundamental understanding of various applications of AI techniques. 2. Analyze the structures and algorithms of a selection of techniques related to intelligent agents, searching, reasoning, machine learning, classification, clustering, artificial neural networks, and other models. 3. Apply the models, and algorithms of AI to solve problems in the analysis and design of information systems. | | |
| **Textbook:** S. Russell and P. Norvig, Artificial Intelligence: A Modern Approach, Prentice Hall, 4th edition.   * + **Book website link: https://aima.cs.berkeley.edu/**   **Reference books:**   1. Machine Learning, Tom Mitchell, McGraw-Hill, eBook link: <https://www.cin.ufpe.br/~cavmj/Machine%20-%20Learning%20-%20Tom%20Mitchell.pdf> 2. Machine Learning: The New AI (MIT Press Essential Knowledge series) by Alpaydin | | |

**Course Content, Learning Material & Activities Schedule**

| WEEK | **TOPICS** | **READING** | **Labs/Assignments/Homeworks** |
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| **1** | Introduction and applications of AI  Intelligent Agents, Behavior, Environment | Ch. 1 - 2 | **Lab:**   * Relevant Data Structures implementation (refresher) * Implement BFS, DFS, UCS   **Assignment 1:** Implement A\* search method  **Homework 1:** A\* and UCS questions  **Quiz 1** |
| **2** | Problem solving by searching  Uninformed search strategy | Ch. 3.1 – 3.4 |
| **3** | Informed search strategy, Optimal Search: A\*  Local search algorithms and optimization (brief) | Ch. 3.5 – 3.7  Ch. 4.1-4.3 |
| **4** | Adversarial search | Ch. 5.1-5.3 |
| **5** | Logic: Syntax and Semantics  Propositional Logic  First Order Logic  Programming for AI: Prolog | Ch. 6.1 – 6.2  Ch. 7.1-7.4 | **Lab:** Do programming in PROLOG  **Assignment 2:** Make family tree in PROLOG  **Homework 2:** Bayesian Network Questions |
| **6** | Probability in AI, Dependence  Bayes Rule, Conditional Independence, Independence | Ch. 8.1-8.5 |
| **7** | Uncertain knowledge and reasoning  Bayesian Network, D Separation | Ch. 12.1-12.7 |
| **8** | **Midterm Exam** | | |  |  |
| **9** | Learning: Supervised and Unsupervised  Naïve Bayes classifier, KNN | Ch.13.1-13.7 | **Lab:** Implement Naïve Bayes Classifier  Implement Regressions  **Homework 3:** Naïve Bayes and decision trees questions |
| **10** | Classification (linear, Decision Trees), Regression |  |
| **11** | Clustering HAG |  | **Lab:** Implement K mean Clustering  **Assignment 3:** Implement HAG |
| **12** | K means clustering |  |
| **13** | Artificial neural network |  | **Lab:** Implement Neural network  **Project Submission** |
| **14** | Case based reasoning/Rule based Reasoning |  |
| **15** | Evolutionary Algorithms: Genetic Algorithms (optional) |  |
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**Out-of-class Study Required:**

**Following are the best practices to succeed in this course:**

* View video lectures (or read course slides/notes) before class time
* Check Moodle and your course WhatsApp group regularly
* At least spend 3 hours at home for reading from book also.
* Do all assignments and HomeWorks yourself

The breakup is as follows:

**Assignments:** 10 %

**Quizzes:**  10 %

**Midterm exam**: 25 %

**Final term exam:**  30 %

**Project** 15 %

**Labs** 10 %

**TOTAL 100%**

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### **Missed Assignments/ Make-Ups/ Extra Credit**

* Late assignments will be accepted with 25% deduction each day.
* No retake of quiz or exam unless approved. Everything needs to be supported by documentary evidence.

**Grade Determination & Course Assessment as per FCC Policy:**

Relative grading will be done so giving your solved assignments and HomeWorks to your friends can have negative impact on your grade

**Changes to the Syllabus:**

This syllabus was designed to convey course information and requirements as accurately as possible. It is important to note however that it **may** be subject to change during the course depending on the needs of the class and other situational factors. Such changes would be for your benefit and you will be notified of them as soon as possible.

**Student Support Services**

[Student Counseling Services](https://www.fccollege.edu.pk/ccc/campus-counseling-center/).Students can contact the [Campus Counseling Center](https://www.fccollege.edu.pk/ccc/campus-counseling-center/) at 0331-444-1518 or email [ccc@fccollege.edu.pk](mailto:ccc@fccollege.edu.pk).

[Writing Center](https://www.fccollege.edu.pk/faculty-of-humanities/writing-center/)

[Mercy Health Center](https://www.fccollege.edu.pk/mercy-health-center/)

**Other Useful FCCU Policy Documents:**

[Sexual Harassment Policy](https://www.fccollege.edu.pk/wp-content/uploads/2018/05/Doc1.pdf)

[Anti-Corruption Policy](https://www.fccollege.edu.pk/wp-content/uploads/2018/05/Anti-corruption.pdf)

[Academic integrity](https://www.fccollege.edu.pk/policy-on-academic-integrity/)

[Plagiarism Policy](https://www.fccollege.edu.pk/wp-content/uploads/2018/05/FCCU-Plagiarism-Policy.pdf)

[Academic Calendar](https://www.fccollege.edu.pk/academic-calendar/)