COURSE SYLLABUS: **SPECIAL TOPICS IN CSCI (ARTIFICIAL INTELLIGENCE)**

COURSE INSTRUCTOR: **MARJANA PRIFTI SKENDULI, PhD**

*Hereby I declare that the following syllabus is prepared by me:*

**Approved by:**

_____

*(Name, Surname, Signature)*

**DEAN OF THE FACULTY**

**Approved by:**

_____

*(Name, Surname, Signature)*

**HEAD OF DEPARTMENT**

*For internal use.*

| | COURSE SYLLABUS | | | | |
|---|---|---|---|---|---|
| 1. | Course Title | Special Topics in CSCI (Artificial Intelligence) | | | |
| 2. | Instructor Name | Marjana Prifti Skenduli PhD | | | |
| 3. | Teaching Load | 3.1 | ECTS | | 6 credits |
| | | 3.2 | Weekly Teaching Hours | | 2+1 |
| | | 3.3 | Teaching Activities | | |
| | | | 3.3.1. | Lectures- theory | 30 hours |
| | | | 3.3.2. | Exercises (laboratory, seminars, teamwork) | 15 hours |
| | | | 3.3.3. | Project, Homework | 60 hours |
| | | | 3.3.4. | Individual learning | 45 hours |
| 4. | Academic Year/ Semester | 2023-2024/Spring | | | |
| 5. | Type of Course | Elective | | | |
| 6. | Study Programme | Bachelor in Computer Science<br>Bachelor in Software Engineering | | | |
| 7. | Email of Instructor | marjanaprifti@unyt.edu.al | | | |
| 8. | Code of Ethics | Students are required to abide to the provisions of the UNYT Code of Ethics and to comply with ethical and moral standards. They must:<br>1. Follow the class schedule and adhere to the rules of the UNYT Statute and Course Regulation;<br>2. Present in a serious and dignified manner in the premises of the institution, which implies appropriate dressing, as well as the use of appropriate vocabulary, in accordance with the norms of ethics, morality and decency;<br>3. Respect the academics, assistant academics and administrative staff, other students and Course Regulations.<br>4. Not engage in provocative or harassing actions or gestures against academics and assistant academic staff or other students.<br>5. Not offer privileges, benefits, interference, favouritism, payments or endowments of any form directly or through other persons, in order to obtain high results, or to seek benefits from the UNYT staff assigned for this duty.<br>6. Not commit plagiarism as required by the UNYT Student Honour Code signed by the student during registration period.<br>7. Not consume alcoholic beverages, tobacco, or other prohibited substances in the premises of the institution.<br>8. Not use the cell phone or any other electronic device as well as keep them turned off during class hours or exams. | | | |
| 9. | Course Description | The course gives an overview of Artificial Intelligence which is a branch of computer science aiming at developing computer systems, which encompass perception, reasoning and learning and to provide an in-depth understanding of major techniques used to simulate intelligence. | | | |
| 10. | Learning Outcomes | The main purpose of this course is to provide undergraduate students with the most fundamental knowledge so that they can understand what Artificial Intelligence is. | | | |

| | | |
|---|---|---|
| 11. | Key Concepts | Uninformed Search<br>Informed Search<br>Game Playing, Constraint Satisfaction<br>Propositional Logic<br>First-order Logic, Inference in First-Order Logic<br>Uncertainty, Bayesian Networks<br>Inference in Bayesian Networks<br>Markov Networks, Markov Logic<br>Decision Theory<br>Decision Tree Induction<br>Statistical Learning<br>Reinforcement Learning |
| 12. | Course Outline | **Week I: Introduction to Artificial Intelligence**<br>*AI history, ethics and responsibility, and what we are covering in this course. (Rusell & Norvig, Chapter 1)*<br><br>**Week II: Uninformed Search**<br>*Problem Solving, State-Space Search and Knowledge Representation. Intelligent Agents. (Rusell & Norvig, Chapter 2, 3)*<br><br>**Week III: Informed Search**<br>*Problem solving. Searching for best solutions; heuristics for efficient search. (Rusell & Norvig, Chapter 4)*<br><br>**Week IV: Game Playing**<br>*Adversarial Search and Game Theory, (Rusell & Norvig, Chapter 5)*<br><br>**Week V: Constraint Satisfaction**<br>*Constraint Satisfaction Problems, Constraint Propagation, Inference… (Rusell & Norvig, Chapter 6)*<br><br>**Week VI: Propositional Logic**<br>*Logical Agents, Logic, Knowledge. (Rusell & Norvig, Chapter 7)*<br><br>**Week VII: Midterm Exam**<br><br>**Week VIII: First-order Logic**<br>*Knowledge representation using first-order logic. Logical reasoning and inference in AI systems. (Rusell & Norvig, Chapter 8)*<br><br>**Week IX: Inference in First-Order Logic**<br>*Strategies for efficient inference in first-order logic. (Rusell & Norvig, Chapter 9)* |

| | | | | |
|---|---|---|---|---|
| | | **Week X: Uncertainty**<br>*Bayesian networks for representing uncertain knowledge. Inference in Bayesian networks, Markov decision processes (MDPs). (Rusell & Norvig, Chapter 13, 14)*<br><br>**Week XI: Bayesian Networks**<br>*Bayesian Network Inference, Learning and applications. Markov decision processes (MDPs). (Rusell & Norvig, Chapter 14)*<br><br>**Week XII: Decision Theory**<br>*Making complex decisions. (Rusell & Norvig, Chapter 16)*<br><br>**Week XIII: Statistical Learning**<br>*Machine Learning: Supervised, unsupervised, and semi-supervised learning. Neural Networks. (Rusell & Norvig, Chapter 20, 21)*<br><br>**Week XIV: Reinforcement Learning**<br>*Reinforcement Learning: Learning from rewards. (Rusell & Norvig, Chapter 22)*<br><br>**Week XV: Final Exam** | | |
| 13. | Learning Methods | Lectures, Seminars, tutorials, interactive instruction, group and individual work | | |
| 14. | Attendance | Minimum **75%** attendance at lectures and exercises. | | |
| 15. | Method of assessment | 15.1. | Final Exam | 40 points |
| | | 15.2. | Midterm Exam | 30 points |
| | | 15.3. | Other Components | 20 points |
| | | 15.4. | Active Participation | 10 points |
| | Assessment criteria | Percentage | Letter Grade | Quality Points |
| | | 90 – 100 | A | 4.00 |
| | | 85 – 89 | A- | 3.67 |
| | | 80 – 84 | B+ | 3.33 |
| | | 70 – 79 | B | 3.00 |
| | | 65 – 69 | B- | 2.67 |
| | | 60 – 64 | C+ | 2.33 |
| | | 50 – 59 | C | 2.00 |
| | | 45 – 49 | C- | 1.67 |
| | | 40 – 44 | D+ | 1.33 |
| | | 35 – 39 | D | 1.00 |
| | | 0 – 34 | F | 0.00 |
| | REMARK: The minimum passing grade for any Course is C. The grades C-, D+ and D are compensable if the current semester GPA is at least 2.00. Details are given in the Program Rules and Regulations. | | | |
| 16. | Textbooks | Author, Year, Title, Publisher | | |

| | | |
|---|---|---|
| | 16.1. Compulsory | 1. Peter Norvig, Stuart Russell, 2022, Artificial Intelligence: A Modern Approach, Global Edition (4th edition), Pearson, ISBN-10 1292401133. |
| | 16.2. Recommended | 1. Nils J. Nilsson, "Artificial Intelligence: A new Synthesis", Harcourt Asia Pvt. Ltd., 2000<br>2. Sutton and Barto. Reinforcement Learning: An Introduction. Covers Markov decision processes and reinforcement learning (free online) |
| 17. | Final Remarks:<br><br>Course Policies<br><br>Format: All written assignments must adhere to APA format: A4 size, Times New Roman font, 12 pt, double spaced with standard margins and page numbers. You should always check your work for spelling and grammar. The paper should be submitted to TURNITIN program, Canvas or email as specified by the course instructor. If you do not have an account in the above mentioned platforms, then you should create one. Please keep in mind that you have to submit your papers within the deadline indicated in the syllabus. Other ways of paper submission are NOT accepted.<br><br>Late Assignments: Assignments should be submitted on the due date in order to receive full credit. For each day or part thereof late, the instructor will reduce the assigned grade by one- third of a letter. The above policy should be considered as being in effect unless the instructor indicates otherwise at the beginning of the semester in the syllabus.<br><br>Academic Dishonesty/Turnitin: UNYT does not tolerate academic dishonesty. Read and familiarize yourself with the UNYT Student Honor Code for a more detailed description of plagiarism and cheating. Please be aware that assignments submitted via TURNITIN must not receive an overall plagiarism mark of over 10%, otherwise they will be graded down significantly. Any assignment with a plagiarism rate of 25% or higher will be automatically graded as an F(0%).<br><br>Generative AI Policy: Each student is expected to submit their own solutions to the course homeworks. The use of generative AI tools such as Co-Pilot and ChatGPT to substantially complete an assignment or exam (e.g by entering exam or assignment questions) is strictly prohibited and will result in honor code violations. We will be checking students' Homework submissions for honor code violations.<br><br>Office Hours: Students are welcome to ask for a meeting regarding any inquires they may have. Preferably, office hours will be pre-assigned by email.<br><br>Learning Difficulties: If you feel that you have encountered special learning difficulties or serious problems that interfere with your studies, please make an appointment with the UNYT's Counseling Office and/or Academic Support Center, For information on any of these centers, please ask your academic advisor. For more information, please contact me or your academic advisor. | |