



**CSCI6350.90L: Advanced Artificial Intelligence
SYLLABUS
Term (Summer II, 2021)**

Subject to any new Texas legislative mandate changes.

COURSE INFORMATION:

Meeting times: To be announced.

Meeting location: online

Course Modality: Online Asynchronous Courses (OASYNC)

INSTRUCTOR INFORMATION:

Instructor Name: Liyu Zhang

Phone: (956) 882-6631

E-Mail: liyu.zhang@utrgv.edu

Office location: online through Zoom

Office hours: To be announced.

WELCOME & INTRODUCTION TO COURSE MODALITY STATEMENT

Online Asynchronous Courses: These courses will be delivered fully online. There will be no designated class meeting time for real-time instructor/student interaction, which gives you the flexibility to engage with the course materials as best fits your daily schedule. Your learning will be guided by the digital presentation of the course content (e.g., recorded lectures, presentations, outlines, notes) and scheduled assignments. Your instructors will provide you with feedback on assigned work, communicate with you electronically, and be available to meet as defined on this syllabus.

COURSE DESCRIPTION, PREREQUISITES & MODE OF LEARNING

Issues of knowledge representation, including a survey of important knowledge-based systems. Current research issues, including neural networks, object-oriented programming in AI, natural language understanding, device understanding, and perception. Prerequisite: CSCI 6305 or consent of instructor.

The materials for this course will be organized into several course modules and mostly delivered through recorded lectures and scheduled assignments. There will not be any designated meeting times for lectures but the instructor will arrange some weekly times, in consultation with students, to held some Q & A sessions.

COVID-19 RESOURCES: *Required on all syllabi. Do not modify.*

Please visit the [UTRGV COVID-19 Website](#) via the following link for the most up-to-date information and resources.

UTRGV VACCINE PORTAL

UTRGV Students are now eligible to receive the COVID-19 Vaccine. Students may access and complete their vaccine profile via the [UTRGV Vaccine Portal](#). For additional information on the COVID-19 Vaccine, please visit the [UTRGV COVID-19 Website](#).

LEARNING OBJECTIVES/OUTCOMES FOR THE COURSE

The purpose of this course is to provide the student with an understanding of traditional and current artificial intelligence approaches and research areas. Specifically, The course aims at achieving the following student learning outcomes (SLOs):

(1) General

- (a): Evaluate AI techniques and synthesize solutions to practical examples.
- (b): Develop a range of typical applications using artificial intelligence methods.
- (c): Demonstrate problem-solving skills.

(2) History and philosophy of artificial intelligence

- a) Define weak and strong AI and provide some arguments for and against each hypothesis.
- b) Discuss accomplishments of artificial intelligence research in historical context.
- c) Discuss the concept of rationality.

(3) Problem solving in artificial intelligence

- a) Explain classical search algorithms, including breadth-first, depth-first, A*, and heuristic search.
- b) Implement classical search algorithms.
- c) Discuss local search algorithms and their applications to finding goals and in optimization problems.

(4) Knowledge and reasoning

- a) Understand key concepts related to knowledge representation.

(5) Machine learning

- a) Define supervised and unsupervised learning.
- b) Discuss learning decision trees.
- c) Understand the principles of neural networks, including single-layer (perceptron) and multi-layer networks.
- d) Understand statistical learning methods, including Naïve Bayes.
- e) Understand reinforcement learning methods and selected algorithms.
- f) Discuss the applications of machine learning to domains such as game playing.
- g) Implement selected machine learning algorithms.

All the above course SLOs supports the following program SLOs, as per departmental assessment plan for the Master of Science in Computer Science (MSCS) program.

MSCS SLO (1): Core Concepts in Computer Science

- (1.1) Students will demonstrate mastery of the foundational concepts in computer science in a) theoretical computer science, b) computer architecture, and c) design and analysis of algorithms. **(Coursework)**
- (1.1) Students will demonstrate mastery of the foundational concepts in computer science in a) theoretical computer science, b) computer architecture, and c) design and analysis of algorithms. **(Comprehensive Examination)**

MSCS SLO (2): Computer Hardware and Software

- (2.1) Computer Hardware and Software: Student is able to use state of the art computational hardware and software for analysis, design implementation and documentation of computing projects (techniques, skills, and modern computing tools necessary for computer science practice). **(Coursework)**

- (2.2) Computer Hardware and Software: Student is able to use state of the art computational hardware and software for analysis, design implementation and documentation of computing projects (techniques, skills, and modern computing tools necessary for computer science practice. (**Exit Survey**))
- (2.3) Computer Hardware and Software: Student is able to use state of the art computational hardware and software for analysis, design implementation and documentation of computing projects (techniques, skills, and modern computing tools necessary for computer science practice. (**Team Projects**))

MSCS SLO (3): Self-Directed Learning

- (3.1) Ability to individually and collaboratively master computing knowledge beyond that presented in coursework through self-directed literature survey, discussion and explanation of computer science literature. (**Thesis Research, Course Projects and Term Papers**).

The mapping between program SLOs and supporting SLOs is shown below, along with the corresponding major assessment components:

Student Learning Outcomes	Program Student Learning Outcomes	Standards	Major Course Requirement/Major Assignment/Examination
(1) General	MSCS SLO (1) and (2)		Homework 1, Project 1 Exam 1
(2) History and philosophy of AI	MSCS SLO (1) and (2)		Homework 2 Exam 1
(3) Problem solving in AI	MSCS SLO (1), (2) and (3)		Homework 3, Project 2 Exam 1
(4) Knowledge and reasoning	MSCS SLO (1) and (2)		Homework 4 Exam 2
(5) Machine learning	MSCS SLO (1), (2) and (3)		Homework 5, Project 3 Exam 2

LEARNING OBJECTIVES FOR CORE CURRICULUM REQUIREMENTS (IF APPLICABLE)

State which core curriculum requirement your course satisfies and list the required core outcomes for your core area. The Student Learning Outcome (SLO) statements which have been approved for use at UTRGV are listed below so you can copy and paste them on your syllabus. Each core area has a required set of 3-4 outcomes as indicated below.

Core Objectives	UTRGV Student Learning Outcome Statement	Core Area Requiring this
Critical Thinking	Students will demonstrate comprehension of a variety of written texts and other information sources by analyzing and evaluating the logic, validity, and relevance of the information in them to solve challenging problems, to arrive at well-reasoned conclusions, and to develop and explore new	Supporting assignments and exam questions for SLOs (1), (3) and (5)

Core Objectives	UTRGV Student Learning Outcome Statement	Core Area Requiring this
Communication Skills	Students will demonstrate the ability to adapt their communications to a particular context, audience, and purpose using language, genre conventions, and sources appropriate to a specific discipline and/or communication task.	Final Presentation
Empirical & Quantitative Skills	Students will be able to make and communicate informed conclusions and predictions based on the interpretation, manipulation, and analysis of empirical	Supporting assignments and exam questions for SLOs (3) and (5)
Teamwork	Students will collaborate effectively with others to solve problems and complete projects while demonstrating respect for a diversity of perspectives.	N/A
Social Responsibility	Students will recognize and describe cultural diversity, the role of civic engagement in society, and the link between ethics and behavior.	Supporting assignments and exam questions for SLOs (1) and (2)
Personal Responsibility	Students will demonstrate an awareness of the range of human values and beliefs that they draw upon to connect choices, actions, and consequences to ethical decision-making.	Supporting assignments and exam questions for SLOs (1) and (2)

TEXTBOOK, TECHNOLOGY, AND/OR RESOURCE MATERIAL

List required of recommended textbooks, reading, and/or any resource material necessary for this course.

Required textbook and resources:

- S. Russell and P. Norvig, *Artificial Intelligence: A Modern Approach, 4e*, Pearson,
 - Hard-Cover: April 28, 2020, ISBN: 978-0134610993, \$159.99 (new) \$89.99 (used), and 41.55(rent),
 - Kindle: May 10, 2020, ASIN : B094NW5N15, \$24.30

Recommended references and resources:

- <http://aima.cs.berkeley.edu/index.html>.
- W. Ertel, *Introduction to Artificial Intelligence, 2e*, Springer, 2017, ISBN 978-3-319-58487-4 (eBook: 978-3-319-58486-7)
- <https://www.lsf.hs-weingarten.de/qisserver/servlet/de.his.servlet.RequestDispatcherServlet?state=wsearchv&search=2&veranstaltung.veranstid=12011&language=en>

GRADING POLICIES

All assignments including homework and projects and exams in this course will be graded on the correctness of both the answers to the questions and the process you show to obtain the answers. Your final grades for this course will be based on your grades in class participation if not exempted, assignments and exams. A breakdown of weights for each category of grading component is as follows.

Class Participation 10%, Assignments 40% (Homework and Projects), Exams 50% (25% each).

I will not make changes in final grades unless the student can document an error on his grade records in a timely manner (See Regrading).

I will use the following number-to-letter grade mapping as dictated by UTRGV to assign final letter grades at the end of the course. I reserve the right to curve up (but not curve down) grades when and if I feel necessary.

100% >= A >= 90% > B >= 80% > C >= 70% > D >= 60% > F

CLASS PARTICIPATION:

Students are expected to participate in all learning activities in this class including completing required reading, joining weekly online Q & A sessions, watching recorded lectures by the due dates, completing all homework and project assignments, and taking two exams. Students may be dropped from the course for excessive absences of aforementioned course activities.

Students' class participation grades will be based primarily on whether you will have watched the recorded lectures for their whole durations by the end of the same week (1159pm, Saturday) the recordings are available. Class participation counts towards your final grade for this course by default. No excuse other than officially documented cases allowable by the university policies, which are usually only for family or extreme health emergencies, will be accepted for absences. You are not required to attend class on days listed in the university calendar as major religious holy days (although I assume that you practice at most one religion). In addition, you're allowed one absence without excuses or grade penalties. Students have the option to be exempted from watching recorded lectures, in which case the percentage weight of class participation will be distributed proportionally among other grading components. To activate this option, however, students must notify the instructor no later than **Monday, July 19th, 2021**.

MAKEUP POLICIES

I generally don't give makeup assignments except officially documented cases allowable by the university policies, which are usually only for family or extreme health emergencies. If you need a makeup work you must notify me ahead of time, or as soon as reasonably possible.

USE OF LECTURE RECORDINGS

The use of recordings will enable you to have access to class lectures, group discussions, etc. in the event you have to miss a synchronous or face to face class meeting due to illness or other extenuating circumstance. Our use of such technology is governed by the Federal Educational Rights and Privacy Act (FERPA), UTRGV's acceptable-use policy, and UTRGV HOP Policy STU 02-100 Student Conduct and Discipline. A recording of class sessions will be kept and stored by UTRGV, in accordance with FERPA and UTRGV policies. Your instructor will not share the recordings of your class activities outside of course participants, which include your fellow students, teaching assistants, or graduate assistants, and any guest faculty or community-based learning partners with whom we may engage during a class session. **You may not share recordings outside of this course.** Doing so may result in disciplinary action under UTRGV HOP Policy STU 02-100 Student Conduct and Discipline.

ACADEMIC INTEGRITY:

Members of the UTRGV community uphold the [Vaquero Honor Code](#)'s shared values of honesty, integrity and mutual respect in our interactions and relationships. In this regard, academic integrity is fundamental in our actions, as any act of dishonesty conflicts as much with academic achievement as with the values of honesty and integrity. Violations of academic integrity include, but are not limited to: cheating, plagiarism (including self-plagiarism), and collusion; submission for credit of any work or materials that are attributable in whole or in part to another person; taking an examination for another person; any act designed to give unfair advantage to a student; or the attempt to commit such acts (Board of Regents Rules and Regulations, STU 02-100, and UTRGV Academic Integrity Guidelines). **All violations of Academic Integrity will be reported to Student Rights and Responsibilities through [Vaqueros Report It](#).**

BLACKBOARD SUPPORT

If you need assistance with course technology at any time, please contact the [Center for Online Learning and Teaching Technology](#) (COLTT).

Campus:	Brownsville	Edinburg
Location:	Casa Bella (BCASA) 613	Education Complex (EEDUC) 2.202
Phone:	956-882-6792	956-665-5327

Toll Free: 1-866-654-4555

Office Hours: Monday - Friday, 7:30 a.m. - 6:00 p.m.

Support Tickets Submit a Support Case via our [Ask COLTT Portal](#)

24/7 Blackboard Support

Need Blackboard assistance after hours? You can call our main office numbers, 956-882-6792 or 956-665-5327, to speak with a support representative.

UTRGV POLICY STATEMENTS

The UTRGV [disability accommodation, mandatory course evaluation statement and sexual misconduct statement](#) are required on all syllabi. Additional policy statements are optional, such as those covering attendance, academic integrity, and course drop policies.

STUDENTS WITH DISABILITIES: [Required on all syllabi. Do not modify.](#)

Students with a documented disability (physical, psychological, learning, or other disability which affects academic performance) who would like to receive reasonable academic accommodations should contact **Student Accessibility Services (SAS)** for additional information. In order for accommodation requests to be considered for approval, the student must apply using the *mySAS* portal located at www.utrgv.edu/mySAS and is responsible for providing sufficient documentation of the disability to SAS. Students are required to participate in an interactive discussion, or an intake appointment, with SAS staff. Accommodations may be requested at any time but are not retroactive, meaning they are valid once approved by SAS. Please contact SAS early in the semester/module for guidance. Students who experience a broken bone, severe injury, or undergo surgery may also be eligible for temporary accommodations.

Pregnancy, Pregnancy-related, and Parenting Accommodations

Title IX of the Education Amendments of 1972 prohibits sex discrimination, which includes discrimination based on pregnancy, marital status, or parental status. Students seeking accommodations related to pregnancy, pregnancy-related condition, or parenting (reasonably immediate postpartum period) should submit the request using the form found at <https://www.utrgv.edu/pregnancy> for review by **Student Accessibility Services**.

Student Accessibility Services:

Brownsville Campus: Student Accessibility Services is located in 1.107 in the Music and Learning Center building (BMSLC) and can be contacted by phone at (956) 882-7374 or via email at ability@utrgv.edu.

Edinburg Campus: Student Accessibility Services is located in 108 University Center (EUCTR) and can be contacted by phone at (956) 665-7005 or via email at ability@utrgv.edu.

MANDATORY COURSE EVALUATION PERIOD: [Required on all syllabi. Do not modify.](#)

Students are encouraged to complete an ONLINE evaluation of this course, accessed through your UTRGV account (<http://my.utrgv.edu>); you will be contacted through email with further instructions. Students who complete their evaluations will have priority access to their grades. Online evaluations will be available on or about:

Summer Module 1 June 23-29, 2021
 Summer I June 28- July 5, 2021
 Summer II August 7-12, 2021
 Summer Module 2 August 12-18, 2021

SEXUAL MISCONDUCT and MANDATORY REPORTING: Required on all syllabi. Do not modify.

In accordance with UT System regulations, your instructor is a “Responsible Employee” for reporting purposes under Title IX regulations and so must report to the Office of Institutional Equity & Diversity (OIED@utrgv.edu) any instance, occurring during a student’s time in college, of sexual misconduct, which includes sexual assault, stalking, dating violence, domestic violence, and sexual harassment, about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at www.utrgv.edu/equity, including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect that is free from sexual misconduct, discrimination, and all forms of violence. If students, faculty, or staff would like confidential assistance, or have questions, they can contact OVAVP (Office for Victim Advocacy & Violence Prevention) at (956) 665-8287, (956) 882-8282, or OVAVP@utrgv.edu.

COURSE DROPS: Recommended on all syllabi; may be modified by the instructor as long as it is not inconsistent with UTRGV policy.

According to UTRGV policy, students may drop any class without penalty earning a grade of DR (drop) until the official drop date. Following that date, students must be assigned a letter grade and can no longer drop the class. Students considering dropping the class should be aware of the “3-peat rule” and the “6-drop” rule so they can recognize how dropped classes may affect their academic success. The 6-drop rule refers to Texas law that dictates that undergraduate students may not drop more than six courses during their undergraduate career. Courses dropped at other Texas public higher education institutions will count toward the six-course drop limit. The 3-peat rule refers to additional fees charged to students who take the same class for the third time.

STUDENT SERVICES: Recommended on all syllabi.

Students who demonstrate financial need have a variety of options when it comes to paying for college costs, such as scholarships, grants, loans and work-study. Students should visit the Student Services Center (U Central) for additional information. U Central is located in BMAIN 1.100 (Brownsville) or ESSBL 1.145 (Edinburg) or can be reached by email (ucentral@utrgv.edu) or telephone: (888) 882-4026. In addition to financial aid, U Central can assist students with registration and admissions.

Students seeking academic help in their studies can use university resources in addition to an instructor’s office hours. University Resources include the Advising Center, Career Center, Counseling Center, Learning Center, and Writing Center. The centers provide services such as tutoring, writing help, counseling services, critical thinking, study skills, degree planning, and student employment. In addition, services such as the Food Pantry are also provided. Locations are listed below.

Center Name	Brownsville Campus	Edinburg Campus
Advising Center AcademicAdvising@utrgv.edu	BMAIN 1.400 (956) 665-7120	ESWKH 101A (956) 665-7120
Career Center CareerCenter@utrgv.edu	BINAB 1.105 (956) 882-5627	ESSBL 2.101 (956) 665-2243

Center Name	Brownsville Campus	Edinburg Campus
Counseling Center Counseling@utrgv.edu Mental Health Counseling and Related Services List	BSTUN 2.10 (956) 882-3897	EUCTR 109 (956) 665-2574
Food Pantry FoodPantry@utrgv.edu	BCAVL 101 & 102 (956) 882-7126	EUCTR 114 (956) 665-3663
Learning Center LearningCenter@utrgv.edu	BMSLC 2.118 (956) 882-8208	ELCTR 100 (956) 665-2585
Writing Center WC@utrgv.edu	BUBLB 3.206 (956) 882-7065	ESTAC 3.119 (956) 665-2538

CALENDAR OF ACTIVITIES: Required on all syllabi. To be completed by the instructor.

Include in this section a table or list that provides a general description of the subject matter of each lecture or discussion.

Day	Topic	Assignments
July 8 th – July 12 th	General and Introduction	Homework 1, Project 1
July 13 th – July 17 th	History and philosophy of AI	Homework 2, Project 1
July 18 th – July 24 th	Problem solving in AI	Homework 3, Project 2
July 25 th – August 1 st	Knowledge and reasoning	Homework 4
August 2 nd – August 8 th	Machine learning	Homework 5, Project 3
August 9 th – August 11 th	Review and Presentation	

Be sure to include important dates relative to the academic calendar. The UTRGV academic calendar can be found at <https://my.utrgv.edu/home> at the bottom of the screen, *prior to login*. Some important dates for Summer 2021 include:

Summer I

- June 1 First day of classes.
- June 2 Last day to add a class or register for Summer I 2021 classes.
- June 28 Last day to drop a class or withdraw.
- July 5 Study Day – NO classes
- July 6 Final Exams
- July 7 Grades Due at 3 p.m.

Summer II

- July 8 First day of classes.
- July 9 Last day to add a class or register for Summer II 2021 classes.
- Aug. 4 Last day to drop a class or withdraw.
- Aug. 12 Study Day – NO classes
- Aug. 13 Final Exams
- Aug. 16 Grades Due at 3 p.m.

Summer III

- June 1 First day of classes.
- June 2 Last day to add a class or register for Summer II 2021 classes.

July 27 Last day to drop a class or withdraw.
Aug. 12 Study Day – NO classes
Aug. 13 Final Exams
Aug. 16 Grades Due at 3 p.m.

DEAN OF STUDENTS RESOURCES:

The Dean of Students office assists students when they experience a challenge with an administrative process, unexpected situation such as an illness, accident, or family situation, and aids in resolving complaints. Additionally, the office helps to advocate on behalf of students and inform students about their rights and responsibilities as well as serving as a resource and support for faculty and campus departments.

[Vaqueros Report It](#) allows students, staff and faculty a way to report concern about the well-being of a student, seek assistance in resolving a complaint, or report allegations of behaviors contrary to community standards or campus policies.

The Dean of Students can also be reached by emailing dos@utrgv.edu or visiting [Virtual Office hours](#) in which a representative is available Monday-Friday 9:00-11:00 a.m. and 1:00-4:00 p.m.