Foundations of Deep Learning
(Intelligent Systems/Artificial Intelligence)
Spring 2024
ECE 4360 (CRN 27053) & EE 5390 (CRN 27054)

FACULTY INFORMATION

Dr. P. Nava
Office: ENGR A-319 or via MS Teams
Phone extension: 915-747-5994
Email: pnava@utep.edu

Office Hours:
3:00 - 4:00 Monday
3:00 - 4:00 Tuesday
10:30 - 11:30 Thursday
Other times by appointment

NOTE: these times are subject to change.

COURSE DELIVERY: HyFlex (In-person/Synchronous/Asynchronous). This is a teaching style where the instructor will be delivering the lecture, in-person, in the assigned classroom, but also transmitting live via TEAMS. The lecture is also recorded, and will be posted on BlackBoard, along with the printout of PowerPoint slides, if used. In this manner, the student has the option of attending the live class presentation, attending virtually via TEAMS, or watching the class presentation later.

COURSE DESCRIPTION:
Concepts and techniques in deep learning (DL) in AI. Historical and current paradigms, methodology for implementation, and their applications.

COURSE OVERVIEW:
Current topics in Deep Learning (DL), beginning with an overview of Intelligent Systems (AKA Artificial Intelligence), including a taxonomy of current systems. Focused introduction to terminology, basic concepts and techniques utilized in Machine Learning (ML), DL, and other Intelligent Systems. Other topics include acquisition of depth in DL, and typical libraries for use of DL in problem solving.

REQUIRED TEXTBOOKS: none required. References will be provided, as needed.

COURSE PREREQUISITE:
ECE 4360: EE 2372 (Software Design I) and EE 3353 (Discrete Time Signals & Systems)
ECE 5390: None

LEARNING OUTCOMES:
Students successfully completing this course will be able to:
1. Utilize a working knowledge of the taxonomy of Artificial Intelligence to classify new and unconventional models.
2. Identify different architectures and paradigms, their limitations and appropriate learning structures.
3. Describe the basic differences between ML, DL, AI, and IS.
4. Describe the difference between Shallow, Deep Feedforward, Convolutional, Recurrent, and Recursive Networks, and identify appropriate optimization techniques for Deep Models.

**GRADING POLICY AND STRUCTURE**

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<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Exams</td>
<td>45%</td>
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<tr>
<td>Project or Final Exam</td>
<td>25%</td>
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<tr>
<td>Homework</td>
<td>20%</td>
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<tr>
<td>Instructor assessment</td>
<td>10%</td>
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**GRADING SCALE:**

- 90 – 100% → A
- 80 – 89% → B
- 75 – 79% → C
- 60 – 74% → D
- < 60% → F

**Homework and Readings:**

A significant portion of your content mastery depends on completion of homework assignments. Homework assignments will include problem sets and/or reading assignments. All assignments must be completed by the posted deadline. Late homework will only be accepted in the case of illness or emergency. Good homework presentation ~ including neat and legible work are expected and required. To receive full credit, all submitted work must begin with **Student’s Name and Assignment number (with assignment title)**, all at the top of the first page.

- Reading Assignments – will be accessed on BlackBoard and have an assigned deadline to prepare for discussion in a particular class. Also, reading assignments can be used to create exam questions.

- Homework - assignments will be due on the designated date and will typically be uploaded via BlackBoard.

**Instructor Assessment:**

Your active class participation will be assessed by interaction during class, seeking out office hours, and other methods of engagement.

- **Accessible content will be posted on Blackboard** *(course handouts, reference materials)*. Be proactive and diligently keep track of your own progress by making sure you access all these resources and meet the posted deadlines.

- Office Hours will provide a venue for questions and discussion. You may attend individually or as a small group, if desired. Additionally, the MS Teams environment can be used for remote office hours, or by appointment. (Please send a TEAMS chat prior to your call in TEAMS to ensure that I am available and you have my attention.)
Technical Support:
If you need technical support with Blackboard, please contact UTEP’s Help Desk at (915)747-4357 (HELP), helpdesk@utep.edu. For help with equipment, internet access and tech support please visit https://www.utep.edu/technologysupport/learningremotely.html

Course Schedule and Important Dates:
The schedule is available as a separate document highlighting topic sequence, key assignments, important dates and activities. Such document is subject to changes at the discretion of the instructor to adapt to the needs of the class.

Course & University Policies

Attendance:
Attendance is not reviewed, but will be considered by your active participation in the class assignments and assessments. If you feel sick or have been exposed to a communicable illness, please do not attend class. You have the option of attending via Teams (if you are up to it), or watching the recording of the lecture at a later date.

Electronic Devices:
You must have access to an internet connected device to access course resources.

Center for Accommodations and Support Services (CASS):
Students requiring unique accommodations must contact the CASS office and provide their instructor with the proper documentation at the beginning of the semester. Please make sure to talk to the instructor at the beginning of the semester to discuss necessary arrangements. The CASS office may be contacted at 747-5148, cass@utep.edu or go to Room 106 Union East Building.

Scholastic Integrity/Academic Honesty:
While collaboration is encouraged, collusion is not. In accordance with University regulations, scholastic dishonesty on a given assignment will be subject to disciplinary action and will be referred to the Office of Student Conduct and Conflict Resolution (OSCCR). Dishonesty/cheating/plagiarizing may result in a zero on the assignment, an "F" in the course, or even suspension from the university. If you need assistance with your assignments, please consult authorized sources of help. For more information on Scholastic Dishonesty and/or Plagiarism, consult the Handbook of Operating Procedures: Student Affairs, which is available on the web, as well as in the Office of Student Life.

Other requirements:
Graduate students taking this course as ECE 5390, who will utilize it as part of their degree plan are responsible for completing all work required of undergraduates. In addition, expectations include:

❖ written review of an article from a current journal;
❖ successful completion of exams, each with different/extra questions prepared for graduate students; and
❖ 80% average (minimum) on homework, quizzes, and exams.