



# COL333/671: Introduction to AI

Semester I, 2024-25

## Course Introduction

Rohan Paul



# Course Information

- Name
  - COL333: Introduction to Artificial Intelligence (UG)
  - COL671: Bridge course (PG)
  - Credits: 4
  - LTP: 3-0-2
- Slot F
  - Days: Tuesday, Thursday, Friday
  - Time: 11:00 – 11:50am.

# Teaching Team

- Instructor
  - Rohan Paul
  - Email: [rohan@cse.iitd.ac.in](mailto:rohan@cse.iitd.ac.in)
  - Website: <https://www.cse.iitd.ac.in/~rohanpaul/teaching>
- Teaching Assistants
  - Will be announced on the web page.
  - Please be respectful to the teaching assistants.
  - They work very hard and play an important role in the delivery of the course.

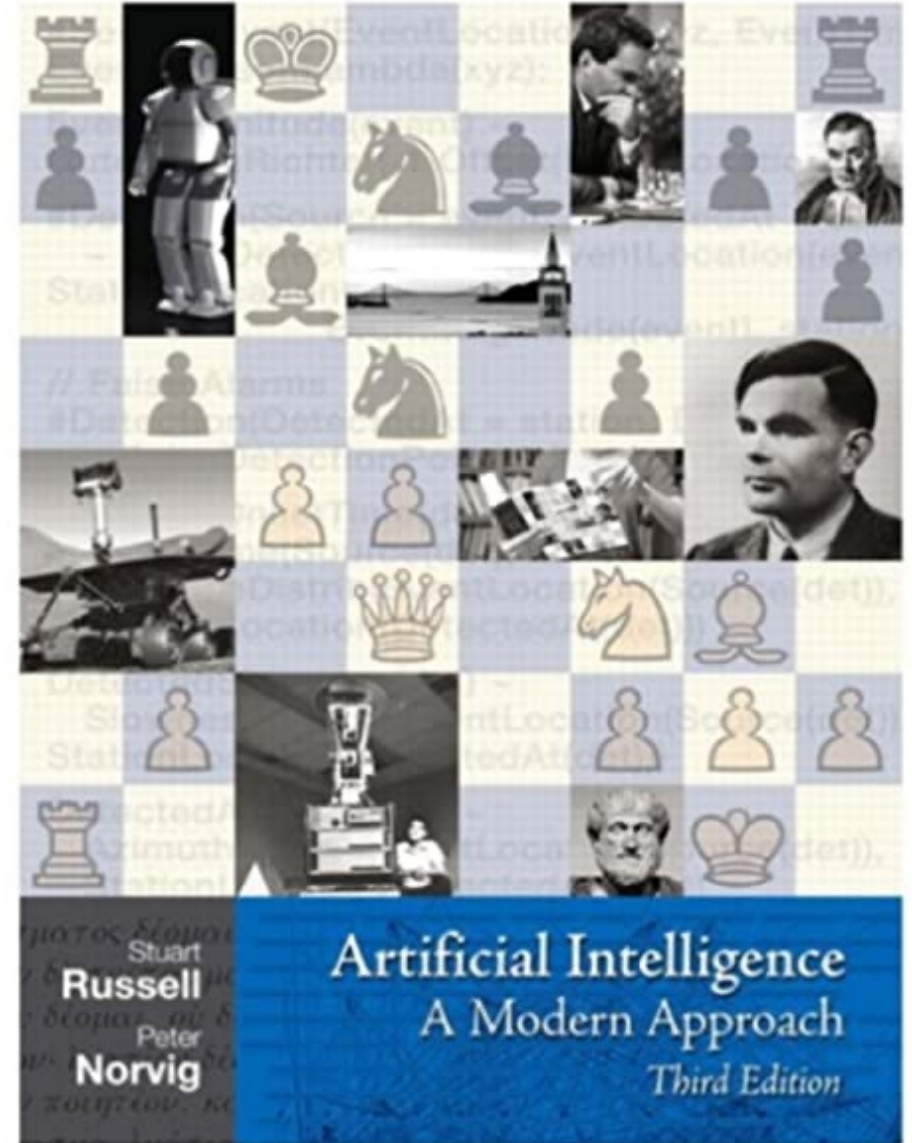
# Teaching Mode

- Lectures
  - Offline Mode
  - Location: LH 108
  - Any slide material will be made available on the website.
  - Extra teaching days may be utilized (discretionary and with prior notification).
- Communication
  - Class mailing lists (col333/col671) setup by the institute.
  - Piazza will be created and announced on the web page. Please use Piazza for assignment related queries.
  - Please ask any questions related to the lectures in class itself.

# Course Organization

Topic list is tentative and will be updated as the lectures are presented.

Topics (tentative)
Introduction
Problem solving as search
Game Playing (adversarial search)
Constraint Satisfaction
Probabilistic Reasoning
Learning and Neural Networks
Markov Decision Processes
Reinforcement Learning
Advanced topics
Conclusions



# Course Introduction

- Artificial Intelligence: set of algorithmic/mathematical tools that apply to a broad set of problems.
- We will motivate each section with a problem, see why it is hard and how to solve with a certain toolkit.
- For each tool, we will explore how to model a problem, how to solve exactly (which may be hard) and how to solve it fast (may be less accurately)
- Also share examples of deployed systems.

Above all, the course is a journey that we take together to learn the foundational tools of this exciting field!

# End of the course

- Learning
  - Understand the “Modeling-Inference-Learning” paradigm.
  - Recognize real-world applications where AI modeling can be applied.
- Foundation
  - Familiarity with the core ideas and insight needed for allied/advanced courses.
  - A toolkit for independent investigation in this area.
- Above all
  - AI is a lot of fun! I hope you enjoy and learn throughout the course.

# Who should take this course?

- Relevant Background
  - Introduction to Programming COL100
  - Data structures COL106
  - Recommended: Algorithms, Probability and statistics, Logic.



# Books and References

- Primary Reference
  - Artificial Intelligence: A Modern Approach (3<sup>rd</sup> Edition). Russell, Stuart J., and Peter Norvig. [Link](#).
- Secondary Reference
  - Reinforcement Learning (Second Edition). Richard Sutton and Andrew Barto. MIT Press. 2018. [Online](#).
  - Deep Learning. Ian Goodfellow, Yoshua Bengio and Aaron Courville. [Online](#).

# Evaluation Criteria (Tentative)

- Theory component: 60%
- Practical Component: 40%
- Margin: ~15% (discretionary)

# Requirements

- Pass Criteria for Credit
  - 30% of the total score in the course
- Criteria for Audit Pass (NP)
  - 40% of the total score in the course with 30% in the examination component and 30% in the practical component
- Class Attendance
  - Clarifications will be provided only in class. The student is requested to track announcements and clarifications given in class.

# Assignments

- Detailed instructions will be provided for each assignment.
- Submissions
  - The submission time will typically be around 5pm.
  - Please ensure access to Moodle for assignment submission.
  - Any delays beyond the submission time will result in late penalty of X% per day (from the submission time). Typically, X is 10%
- No deadline extensions please.
- Requests to resubmit an evaluation for grace marks after the deadline is not permitted.

# Assignments

- Proficiency
  - Programming proficiency expected (Python 3).
  - Any starter code released will only be checked on Ubuntu systems. Assignment evaluations will also be on Ubuntu-based machines. Hence, it is preferred to do your assignments on an Ubuntu system.
- Please carefully follow the guidelines and input/output formats
  - Evaluations are done with automated scripts which are the same for the whole class.
  - Deviations from the prescribed guidelines will lead to your code not running for test cases leading to loss of points.
  - Please note that such violations slow down/stall assessments for the whole class and introduces delays.
  - Inability to follow interface guidelines will lead to deductions in order to be fair to other students. It takes away time from the TA which could have been better used for the course.

# General

- Please study the material regularly. Read the problem statements once it is released, work towards a plan for your implementation and please keep time for experiments. Assignments require careful thought.
- Please don't leave assignments till the last moment. A last-minute dash is stressful and spoils the fun of learning/building something yourself.
- Please be regular with the course material and manage your time well. There may be several courses with assignments throughout the semester.

# Examinations

- Examination Mode
  - Offline mode or as per the Dean UG's instructions
  - One mid-term examination and one major examination
  - Any additional information regarding exam logistics will be provided before the exam
- General
  - Again, please study regularly. Solving problems in a fixed duration requires you to have internalized the material well.
  - There are lots of online and book references for the interested student to explore.
  - In case any additional forms of evaluation is introduced (e.g., quiz) then prior notification will be provided.

# Academic Integrity

- Please listen to your conscience. Please do not cheat.
  - Please write code or other written submissions from scratch independently. Sharing of code or parts of it or posting it online will constitute a violation of the honor code.
  - Only submit work from your own efforts. Do not look at or refer to code written by anyone else. You may discuss the problem; however, the code implementation must be original. Discussion will not be grounds to justify software plagiarism.
  - Code similarity s/w e.g., MOSS may be used check plagiarism in code and results may be released. The assessment and handling of plagiarism is the Department's prerogative.
  - Submission of code written by some one else or from internet sources will be excluded from any evaluation.



# Honor Code Violations

- Deductions/Penalties
  - In case of honor code violations, deductions/penalties are done for fairness to other students in class who do their work honestly.
  - We are duty bound to follow the disciplinary procedures of the Department and the Institute in this regard.
  - Plagiarism in assignment/exam will result in zero in the assignment/exam and an additional penalty on an absolute scale (at least -10 absolute). Department and institute procedures such as DISCO and an F-grade will follow.

# Honor Code Violations

- An assignment is a single unit with a holistic learning objective
  - Copying or cheating in even a sub-part of an assignment or an exam will be counted as plagiarism in the whole assignment/exam. The whole assignment and exam will be made void with additional penalties and Dept. procedures.
  - In case an assignment allows working in pairs, both students will receive penalty even if only one student may be involved.
- Names will be released/forwarded to the Dept. and the institute as per guidelines. Information will be shared with other faculty members for future courses and projects.

Honesty and a clear conscience is the best policy! Please do work based on your own efforts and not by cheating.

# Other Guidelines

- Medical Emergencies
  - Requests for late submissions for assignments or re-appearing in an exam on the grounds of medical emergencies must be accompanied with a medical certificate from a qualified doctor indicating that you were unwell in the period of submission and a proof of prescription.
  - Submitted to the instructor before the submission deadline not afterwards.
- Re-exams
  - Any request to appear in the re-minor will require formal and authentic proof that you were unwell or exceptional circumstances prevailed during the minor due to which you could not appear. The proof will be used by the Department and the Dean to decide if a re-minor will be permitted or not.
  - Note that the re-exams are harder than the normal examination.

# Teaching Assistants

- Teaching Assistants play a very important role in the course. They do a lot of work behind the scenes to ensure the success of the course.
- Some of you will also become TAs in the future.
- Please be respectful to the teaching assistants.

# Next Time

- This Class
  - Course logistics
- Next Class
  - Introduction to AI.