COSC 4368 (Fall 2025)

Review List Midterm Exam Thursday, October 16, 2:30p

Last updated: October 12 at 11a

The 2025 Midterm Exam takes place in two class rooms: Students whose last name starts with letters A-G will take the exam in MH 130, whereas students whose last name starts with letters H-Z will take the exam in 232 PGH. That is, if your last name starts with A-G, please come to MH 130 on October 16, 2:30p to take the exam.

The exam will take 75 minutes and might be slightly too long. The exam is open-books and notes, but friends and other human beings are not permitted to help you and, more importantly, **the use of computers and cell phones is not permitted!**

Weight: The midterm exam counts 21-23% towards your overall grade.

Remark: On the course website you find exams from previous semesters and also reviews for those exams.

Relevant slide shows, pasted from the COSC 4368 Website:

2025 Search Transparencies:

* [Search1](http://www2.cs.uh.edu/~ceick/ai/search1.pptx) (Classification of Search Problems, Terminology, and Overview ), [Search2](http://www2.cs.uh.edu/~ceick/ai/search2.pptx) (Problem Solving Agents), [Search3](http://www2.cs.uh.edu/~ceick/ai/search3.pptx) (Heuristic Search Exploration and Local Search), [Search4](http://www2.cs.uh.edu/~ceick/ai/search4.pptx) (Randomized Hill Climbing and Backtracking; not covered in textbook), [Backtracking Wiki](https://en.wikipedia.org/wiki/Backtracking) ,[Search5: Games](http://www2.cs.uh.edu/~ceick/ai/Games2021.pptx) (credit for almost all slides goes to ai.berkely.edu, reduced coverage in 2022),  [Search6: Constraints Satisfaction Problems](http://www2.cs.uh.edu/~ceick/ai/CSP%27.pptx) (credit for some slides goes to ai.berkeley.edu),  [Search7: More on Expansion Search](http://www2.cs.uh.edu/~ceick/ai/search7.pptx) (only material which centers on greedy search and A\* will be covered in 2025),

Midterm1 will only ask very basic question about games (Search5) and there will be nothing in the exam about card games. You should know the following approaches algorithms well: Best-first search, greedy best first search, A\*, randomized and classical hill climbing, simulated annealing, backtracking in general and using backtracking and local search for constraint satisfaction problems.

Evolutionary Computing

2023 Teaching Material on Evolutionary Computing (**EC**): EC1: [Introduction to Evolutionary Computing](http://www2.cs.uh.edu/~ceick/ai/EC1_2023.pptx) (by Eiben and Smith covering Chapter 3 of their book) and EC2:[Example: Using EC to Solve Travelling Salesman Problems](http://www2.cs.uh.edu/~ceick/ai/EC2.pptx), [Eiben-Smith Introduction to EA](http://www2.cs.uh.edu/~ceick/ai/Eiben-Smith-EC.pdf) (they call 'EC': 'EA'!),

Game Theory

  [G1](http://www2.cs.uh.edu/~ceick/ai/G1.pptx): Introduction to Game Theory (USC Economics slide show by Shivendra Awasthi (???), will be used in the lecture)

Machine Learning

2025 Machine Learning Coverage:

* [A Gentle Introduction to Machine Learning](http://www2.cs.uh.edu/~ceick/ai/4368-ML-Intro.pptx)
* Reinforcement Learning: [RL1](http://www2.cs.uh.edu/~ceick/ai/RL1.pptx) (Introduction to Reinforcment Learning),

Focusing on the role of exploration/exploitation, differences to other learning methods, know what policies are, Bellman Equations, Temporal difference learning, you should be able to provide the Bellman equations for an example and should be able to apply temporal difference learning, SARSA and Q-Leaning for an example world.

Tentative weights of topics in the midterm exam: Search 55-60%, Machine Learning 25-30%, Games (10%), EC(10%).

Relevant material from the Russel textbook (Fourth Edition):

Chapter 3: pages 63-106; Chapter 4: 110-115 Chapter 5: 146-158, Chapter 6: 180-200, Chapter 17: 562-569, 572-576 Chapter 22: 789-803.

Relevant pages from the Eiben-Smith Chapter: The whole article except sections 2.4.1, 2.5 and 2.7 are not relevant for the 2025 Midterm Exam.

[Introduction to Supervised Learning](http://www2.cs.uh.edu/~ceick/ai/Eick_SL.pptx) (also called "Learning from Examples")

Other relevant material:

[Backtracking - Wikipedia](https://en.wikipedia.org/wiki/Backtracking)

[Eiben-Smith-EC.pdf (uh.edu)](https://www2.cs.uh.edu/~ceick/ai/Eiben-Smith-EC.pdf)

Remark: The midterm will not cover the general AI discussions in the first week of the semester and Neural Nerworks, which will be covered in the Final exam. In general, there will be very little or nothing about supervised learning in the exam.There will be no programming tasks in the exam.