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Artificial Intelligence Graduate Program Course Planning

Earning the certificate: To complete the Artificial Intelligence Graduate Program, you must complete one required course and three elective courses. You must receive a B (3.0) or better in each course in order to continue taking courses via the Non-Degree Option Program.

General Prerequisites: Before beginning, you should have strong backgrounds in programming (C/C++, python), linear algebra, calculus, as well as statistics and probability. Each course may have individual prerequisites. You can find more detailed information about each course via the course webpage on Stanford Online.

Required Courses (Complete at least 1)

Schedule is subject to change

COURSE NAME & NUMBER	PREREQS	UNITS	AUTUMN	WINTER	SPRING	SUMMER
Artificial Intelligence: Principles and Techniques CS221		**4**	Online		Online	
Machine Learning CS229		**4**	Online		Online	TBD

Elective Courses (Complete at most 3)

Schedule is subject to change

COURSE NAME & NUMBER	PREREQS	UNITS	AUTUMN	WINTER	SPRING	SUMMER
Decision Making Under Uncertainty AA228		**3-4**		Online		
Principles of Robot Autonomy AA274A		**3-4**	Online			
Computational Logic CS157		**3**	Online			
Introduction to Robotics CS223A		**3**		Online		
Natural Language Processing w/ Deep Learning CS224N	CS221	**4**		Online		
Natural Language Understanding CS224U	CS221 or CS224N	**4**			Online	
Machine Learning with Graphs CS224W		**4**		Online		
Probabilistic Graphical Models: Principles and Techniques CS228		**4**		Online		
Deep Learning CS230	CS229 may take concurrently	**4**	Online			

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COURSE NAME & NUMBER	PREREQS	UNITS	AUTUMN	WINTER	SPRING	SUMMER
Computer Vision: From 3D Reconstruction to Recognition CS231A		**4**		Online		
Deep Learning for Computer Vision CS231N	CS229	**4**			Online	
Reinforcement Learning CS234	CS229 or equivalent	**3**		Online		
Deep Generative Models CS236	CS228, CS221, CS229 or CS230	**3**	Not offered AY22-23			
Principles of Robot Autonomy II CS237B	AA274A	**4**		Online		
Deep Multi-task and Meta Learning CS330	CS229 or equivalent	**3**	Online			
Machine Learning Theory STATS214	CS229	**3-4**	Online			
Mining Massive Data Sets CS246		**4**			Online	

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Your Program Road Map

You have up to three academic years to complete the program. You should expect to spend a minimum 15-20 hours per week on course work.

There are many pathways through the Artificial Intelligence Graduate program. Your path will depend in part on what you're interested in studying. We recommend starting with CS221 because it is a prerequisite for many of the elective courses. Due to its difficulty, we do not advise taking CS229 unless you have taken other courses via the Non-Degree Option Program.

Below are sample schedules, depending on which quarter you choose to begin. These schedules may not all be possible every year as class offerings vary:

	Autumn	Winter	Spring	Summer	Autumn	Winter	Spring
Autumn Start (NLP)	CS221	CS224N	CS224U	CS229*			
Winter Start		CS228	CS221	CS229*	STATS214		
Spring Start			CS221	CS229*	CS330	CS234	
Summer Start (Robotics)				CS229*	AA274A	CS237B	CS221
Summer Start (Vision)				CS229*	CS221	CS231A	CS231N

*tentative

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Preparing for the Program

If you have little programming experience, you should consider Stanford's Foundations in Computer Science Graduate Program or the Introductory Programming Graduate Program. Completing the program will satisfy the programming prerequisites for CS221: Artificial Intelligence: Principles and Techniques. If you have no prior programming experience you will need to begin with CS106A and CS106B.

If you don't have the required mathematics, you should consider these Stanford courses: for probability and statistics, CS109 or STATS116; for Linear Algebra, ENGR108. Not all the mathematics prerequisites can be met through Stanford courses. We recommend exploring options at your local community college.

If you need a refresher to prepare, you should consider the following self-study resources. This list includes resources that other learners have found useful. Their inclusion does not imply any specific endorsement by SCPD.

Mathematics

- Mathematics for Machine Learning series from Imperial College London
- Stanford CS229 Linear Algebra Review and Reference
- MIT Single Variable Calculus
- MIT Multivariable Calculus
- MIT Linear Algebra course
- MIT Mathematics for Machine Learning
- The Matrix calculus for Deep Learning

Statistics and Probability

- Stanford CS229 Review of Probability Theory
- Stanford CS229 Statistics and Probability Refresher

Python

- Introduction to Computer Science and Programming Using Python
- Applied Data Science with Python
- Stanford CS231n Python/Numpy Tutorial

If you are interested in self-study, you can browse our free recordings of Stanford AI courses.

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