AAS in **AI Engineering**

Term 1

Introduction to programming with Python
Course PY101

✦ 4 Credits

This course provides a foundational introduction to computer programming using Python. Students will learn core programming concepts including variables, data types, control flow, and basic functions. The course also covers how computers execute programs, how to install Python, and how to select and use a code editor effectively. Emphasis is placed on developing logical thinking and problem-solving skills through hands-on practice.

Data structures & algorithms in Python
Course PY102

✦ 4 Credits

Students will deepen their programming proficiency by exploring essential data structures and algorithmic principles using Python. Topics include abstract data types (ADTs), algorithm efficiency, Big O notation, and time complexity analysis. Through practical examples and coding exercises, students will understand how to select and implement appropriate data structures and algorithms to solve computational problems efficiently.

Object-oriented programming (OOP) in Python
Course PY103

✦ 4 Credits

This course introduces students to object-oriented programming concepts and their implementation in Python. Topics include class creation, object instantiation, encapsulation, inheritance, and polymorphism. Students will examine the advantages and challenges of OOP, trace its historical development, and apply OOP principles to build modular and maintainable applications through hands-on coding.

Term 2

Software engineering principles & version control
Course PY104

✦ 4 Credits

This course introduces key principles of software engineering along with practical version control skills. Students will learn about software development methodologies, including the Waterfall model, and examine team roles, ethical responsibilities, and the software development lifecycle. Through a mini-project, students will apply version control practices using tools such as Git, fostering collaboration and code management skills essential for real-world development environments.

Web fundamentals & introduction to Flask
✦ 4 Credits

Course BE101

This course introduces students to web development using Flask. Topics include: What is web development?, the history and evolution of the web, static vs. dynamic applications, an overview of core web technologies, and the structure of the internet and web applications. Students gain hands-on experience building basic web apps using Flask.

RESTful API development with Flask
✦ 4 Credits

Course BE102

Students learn to build and manage RESTful APIs using Flask. Topics include: What is an API?, types of APIs (REST, RPC, GraphQL overview), REST principles and constraints, designing RESTful URLs and naming conventions, and implementing CRUD operations mapped to HTTP methods.

--- Term 3 ---

Databases: SQL & NoSQL basics
✦ 4 Credits

Course BE103

This course introduces students to core database concepts and their applications in modern development. Topics include: What is a database?, overview of database management systems (DBMS), types of databases (relational and non-relational), database use in web and AI contexts, and key concepts like tables, rows, columns, and keys.

Authentication, authorization, and middleware in Flask
✦ 4 Credits

Course BE104

Students explore security and access control in web applications using Flask. Topics include: introduction to web app security, authentication concepts and flows, authorization design patterns, user models and schema design, and implementing user registration and middleware in Flask.

Advanced backend concepts and microservices (Flask)
✦ 4 Credits

Course BE105

This course covers advanced backend topics and scalable architecture using Flask. Topics include: organizing large-scale Flask projects, managing configurations, using Flask extensions, asynchronous programming with asyncio and async/await, and an introduction to microservice architecture and backend modularity.

Backend project

Course BE106

✦ 4 Credits

This capstone-style course guides students through building a complete backend application from scratch. Students will implement features such as user authentication, user management, and CRUD operations. They will also deploy their project using Docker and Git-based version control, reinforcing skills in backend architecture and development workflows.

Introduction to TypeScript & modern JavaScript

Course FE101

✦ 4 Credits

This course introduces students to JavaScript and TypeScript, equipping them with essential frontend programming skills. Topics include the history and evolution of JavaScript, its engines and runtimes, TypeScript fundamentals, setting up a development environment, and understanding key concepts like statements, expressions, and blocks.

Building interactive UIs with React

Course FE102

✦ 4 Credits

Students will learn to build dynamic user interfaces using React. Topics include: what is React and its benefits, the history and evolution of React, comparisons with other frontend frameworks, the concept of single-page applications (SPAs), and how to set up a frontend environment with Node.js and npm/yarn.

Term 5

Frontend integration project

Course FE103

✦ 5 Credits

The frontend integration project (focused on frontend with full-stack connectivity) equips students with hands-on experience in end-to-end application design. Students will explore topics such as defining an application domain and project scope, writing user stories and acceptance criteria, creating wireframes and UI mockups, mapping backend API endpoints and data flows, and planning authentication and authorization logic.

Introduction to AI concepts & math foundations
✦ 4 Credits

Course AI101

This course introduces foundational concepts in artificial intelligence and the mathematical principles that support them. Topics include: What is artificial intelligence?, a brief history of AI, symbolic vs. statistical AI, general vs. narrow AI, and the ethical and societal implications of AI technologies.

Fundamentals of machine learning
✦ 4 Credits

Course AI102

Students gain a practical introduction to the core principles of machine learning. Topics include: What is machine learning?, types of ML approaches, an overview of the ML workflow, framing ML problems, and strategies for data collection, preprocessing, and understanding.

Term 6

Prompt engineering & working with LLMs
✦ 4 Credits

Course AI103

This course explores techniques for developing AI applications using large language models (LLMs). Students will cover topics such as: what are LLMs?, the evolution of language models, basics of transformer architecture, pretraining and fine-tuning, transfer learning, and an overview of key LLMs used in industry today.

Applied AI capstone project (AI-powered full-stack application)
✦ 5 Credits

Course AI104

This capstone course challenges students to apply their knowledge in a full-stack AI project. Topics include: defining project scope and objectives, selecting architecture and tech stack, choosing datasets and models, designing a project roadmap and milestones, and integrating an AI model or LLM into the final solution.

Professional profiles and personal branding
✦ 3 Credits

Course CD101

This course guides students in building compelling professional materials and a personal brand in the AI industry. Topics include: crafting effective resumes and LinkedIn profiles, creating a professional online presence, writing personal value propositions, and presenting oneself as an AI professional. Students will participate in peer reviews and develop a polished portfolio by course end.

AI project portfolio development

Course CD102

✦ 3 Credits

This course guides students through curating and presenting a comprehensive AI project portfolio. Students will learn how to select, document, and showcase their AI work, create impactful case studies, and build a professional portfolio website. The course emphasizes hands-on project demonstrations and culminates in a complete portfolio that highlights students' technical expertise and business value to potential employers.

AI career strategy and interview preparation

Course CD103

✦ 3 Credits

This course prepares students for the AI job application and interview process. Topics include job search strategies tailored to AI roles, resume and application targeting, technical and behavioral interview preparation, and salary negotiation tactics. Students will participate in mock interviews, coding exercises, and develop a personalized career plan and interview strategy.

AI career launch workshop

Course CD104

✦ 3 Credits

This hands-on workshop supports students as they actively navigate the AI job market. Under instructor guidance, students will apply for real AI positions, receive live interview coaching, engage in networking events, and access personalized support throughout their job search. The course bridges the gap from education to employment and is designed to help students secure interviews and offers before graduation.

Essentials of public speaking

Course SPH 100

✦ 4 Credits

Develop the confidence and competence to speak effectively in public settings. This course emphasizes speech preparation, audience analysis, and delivery techniques. Students will practice informative, persuasive, and impromptu speeches while gaining critical feedback to refine their communication style. Emphasis is placed on overcoming speech anxiety, organizing content logically, and using non-verbal cues effectively.

General Psychology

Course PSYC 100

✦ 4 Credits

An introduction to the scientific study of behavior and mental processes. Topics include cognition, perception, learning, development, personality, psychological disorders, and social dynamics. This foundational course combines theory with real-world applications, encouraging students to understand how psychological principles impact everyday life and personal well-being.

English Composition

Course ENGL 100

✦ 4 Credits

Focuses on developing clear, coherent, and persuasive written communication. Students will learn strategies for drafting, revising, and editing various types of academic and professional writing. The course emphasizes critical thinking, research, citation practices, and the development of a personal writing voice through essays, reports, and reflective writing.

Term 9

Global Environmental Change

Course ENVR 200

✦ 4 Credits

Explore the scientific, political, and social dimensions of environmental change on a global scale. Topics include climate change, biodiversity loss, deforestation, pollution, and sustainable development. Students will analyze the human impact on ecosystems and evaluate policy and technological responses to environmental challenges.

American History Since World War II

Course HIST 200

✦ 4 Credits

A study of major political, social, economic, and cultural developments in the United States from 1945 to the present. This course examines key historical events such as the Civil Rights Movement, the Cold War, Vietnam, the rise of globalization, and contemporary political shifts, with an emphasis on critical analysis and historical interpretation.

College Mathematics

Course MATH 200

✦ 4 Credits

Provides a practical and conceptual foundation in mathematics for college students. Topics may include algebra, functions, statistics, probability, and problem-solving strategies relevant to various fields. The course prioritizes real-world application and critical thinking over abstract theory, helping students build quantitative literacy and analytical skills.