ITMD 546 Syllabus

ITMD 546 Web Microservices and APIs

Hours: 3 credit hours / 45 contact hours

Instructor: Karl Stolley

Textbook, title, author, and year:

a. *Design and Build Great Web APIs*, Admundsen, M, 2020.

Specific course information:

a. Catalog description: This course covers fundamental principles and methods for programmatically accessing and parsing data returned by internet-available data APIs. The course guides students in carefully examining the structure of API endpoints expressed as URLs and the conventions of RESTful architecture.
b. **Prerequisites:** ITMD 541.

Specific goals for the course

a. **Course Outcomes:**
Students completing this course will learn to:
- Develop familiarity with the key principles of Application Programming Interfaces, for both programming languages and data/software services, and as both a consumer and producer of APIs
- Develop critical reading skills for navigating and comprehending the documentation for APIs
- Understand and apply progressive enhancement and responsive design in any user-facing web design and development
- Develop an agile approach to digital development, supplemented by the use of a version control system (Git)
- Identify, analyze, and assess user needs and take them into account in the selection, creation, evaluation, and administration of computer-based systems
- Assess, apply, and continually monitor security principles and practices used to maintain operations in the presence of risks and threats

c. **Course student outcomes:**
At the conclusion of this course, successful students will be able to:
- Learn to locate, read, and act in accordance with Web API providers' terms of service
- Understand and employ lightweight data serialization formats (e.g., JSON) on both the client- and server-side
- Understand and implement web standards from the World Wide Web Consortium (W3C), Ecma, ISO, and other standards-issuing groups
- Investigate and apply current technical and mathematical concepts and practices in core information technologies and recognize the need to engage in continuing professional development.
- Develop familiarity with the academic research and scholarship surrounding web design and development.

Topics to be covered:

a. Request/Response and RESTful Architecture
b. API Structure and Endpoints
c. API Documentation
d. Data Serialization Formats I: CSV, XML
e. Data Serialization Formats II: JSON, JSONP
f. Asynchronous Requests
g. CORS Restrictions
h. Validating Data Integrity
i. From Consuming to Publishing APIs
j. API-First Design
k. Evaluating End-User/Consumer Needs
l. Serving APIs: CORS Configuration
m. Versioning API URLs and Schema
n. Restrictive Access Strategies
o. Client- and Server-Side Storage and Caching