COURSE SYLLABUS

Web Application Security Fundamentals Course (Self-Paced)

Self-paced federal web application security across five two-hour modules, written for developers and oversight staff together. No lab environment required at any point.

> Group classes in Live Online and onsite training is available for this course. For more information, email onsite@graduateschool.edu or visit: https://www.graduateschool.edu/courses/web-application-security-fundamentals-self-paced

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Course Outline

Module 1

- Foundations of Web Application Security and the Federal Policy Landscape
- What a web application is and why it is a common attack surface
- The CIA triad applied to federal systems
- Threat actors from nation-state to insider
- Shared responsibility across developers, system owners, ISSOs and users
- FISMA, the Risk Management Framework and the authorization process, Executive Order 14028 and its amendments, and Cybersecurity Framework 2.0
- How to tell when a policy has been superseded

Module 2

- Common Web Application Vulnerabilities
- How the OWASP Top 10 is developed and why federal secure-coding guidance references it
- The 2025 edition categories including broken access control, cryptographic failures, injection, insecure design and misconfiguration, vulnerable and outdated components, authentication failures, server-side request forgery, and logging and monitoring failures
- Why each is consequential for federal systems

Module 3

- Secure Development Practices and the Secure SDLC
- The phases of a secure development lifecycle
- Input validation, output encoding, least privilege, secure defaults and failing securely
- Security requirements and threat modeling before code is written
- Static and dynamic testing at a conceptual level
- Open-source and software supply chain risk
- How secure development supports the path to an authorization to operate

Module 4

- Authentication, Access Control, and Data Protection
- Authentication versus authorization
- Multifactor authentication and federal digital identity assurance levels
- Role-based and attribute-based access control and least privilege
- Zero Trust principles applied to web applications
- Protecting data at rest and in transit including FIPS-validated encryption
- Common mistakes such as exposing sensitive data in URLs and weak session management

Module 5

- Monitoring, Incident Response, and Ongoing Compliance
- Continuous monitoring under the Risk Management Framework
- Federal event-logging expectations for incident investigation
- Recognizing and reporting a suspected web application incident
- How FISMA reporting and periodic reauthorization keep systems accountable
- What any employee should do on suspecting a compromise