IS421: Advanced Web Applications

Spring 2025 Syllabus

Course Information

Attribute	Details
Course Number	IS421
Section	102
CRN	13547
Course Title	Advanced Web Applications
Credits	3 credits, 3 contact hours (3;0;0)
Prerequisites	IS 219 and (IS 331 or CS 331)
Meeting Time	Thursday, 6:00 PM - 8:50 PM
Location	KUPF 208
Delivery Mode	Face-to-Face

Instructor Information

Attribute	Details
Name	Keith Williams
Office	GITC 3420
Email	kwilliam@njit.edu (**Discord Preferred**)

Office Hours (GITC 3420)

Day	Time	Format	Designated Course
Tuesday	1:00 PM - 2:20 PM	In-Person/Discord	IS601
Thursday	4:00 PM - 5:30 PM	In-Person/Discord	IS421

Day	Time	Format	Designated Course
Friday	4:00 PM - 5:30 PM	In-Person/Discord	IS322

Additional Support:
- Available on Discord throughout the week
- Quick questions can be answered anytime on Discord
- Virtual meetings can be scheduled outside office hours by appointment
- Message on Discord before visiting office hours
- **All students are welcome during any office hour time slot**

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Course Description

- This course focuses on the design, development, and management of cloud-based web information systems within the context of startup companies and established organizations. Topics include business, organizational, and technical challenges faced by developers, project managers, and business development professionals when creating web-based software products.

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- The course consists of readings, discussions, and a final team project demonstrating modular design, scalability, maintainability, and processes for ongoing application development.

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Course Technologies

- **Development**: Python, Docker, Git, GitHub
- **Cloud Platform**: DigitalOcean
- **CI/CD**: GitHub Actions
- **Monitoring**: Prometheus, Grafana
- **Communication**: Discord, Canvas
- **Required Setup (Week 1)**
- Python development environment
- Docker Desktop
- Git with SSH keys configured
- GitHub account
- Discord account

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- # Course Structure
- ## Grade Distribution

Component	Weight
Team Project	**50%**
- Implementation	40%
- Code Quality	20%
- Security	20%
- Testing	20%
Methodology Assessments	25%
Technology Demonstrations	25%

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- ## Project Milestones

Milestone	Deadline
Environment Setup & Team Formation	Week 1
Project Proposal & Architecture	Week 3
MVP Development	Week 6
Deployment Pipeline	Week 9
Testing & Security Implementation	Week 12
Final Deployment & Presentation	Week 15

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- ## Weekly Topics
1. Course Introduction & Environment Setup
2. Cloud Architecture & DigitalOcean
3. Docker & Containerization
4. CI/CD Implementation
5. Modular Design Patterns
6. Testing Strategies
7. Security Best Practices
8. Monitoring & Logging

9. Scaling Applications
10. Performance Optimization
11. Database Design & Management
12. Production Deployment
13. Project Integration
14. Documentation & Maintenance
15. Final Presentations

Course Policies

Late Submissions

- **Assignments**: -10% per day, max 2 days
- **Projects**: -10% per day, max 4 days
- No submissions accepted after the maximum late period
- Exceptions require proper documentation

Communication

- **Primary Channel**: Discord
- **Response Time**: 24 hours
- Technical issues must be addressed during office hours
- Include screenshots or GitHub links for technical questions

Academic Integrity

- Original work is required
- AI tool usage **must** be documented
- Violations will be reported to the Dean of Students
- Follow the NJIT Academic Integrity Policy

Use of AI Tools

- Document all AI tool usage
- Ensure understanding of generated code
- Validate AI suggestions for accuracy
- Follow security best practices
- Use AI to support learning, not replace it

Resources

- Course GitHub Repository
- DigitalOcean Documentation
- Technical Documentation Hub
- Discord Support Channel
- NJIT Canvas

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  - **Syllabus subject to change with notice via Discord/Canvas.**
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