## Course Syllabus

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| **Code - Course Title** | **AYG221 - Artificial Intelligence Supported Automation Systems** |
| **Course Type** | III. SEMESTER |
| **Laboratory + Practice** | 2+1 |
| **ECTS** | **3.0** |
| **Language of Instruction** | Türkçe |
| **Course Type** | Area Elective Courses |
| **Course Instructor(s)** | ÖĞR. GÖR. DR. HANDE TİRYAKİ |

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| **Mode of Delivery** | Face to face |
| **Prerequisites** | There are no prerequisites or corequisites for this course. |

## Course Syllabus

| Weeks | Learning Outcomes | Topics | Teaching Methods |
|---|---|---|---|
| **Week - 1** | | Automation and Orchestration Concepts: Basic Concepts, System Architectures, and Future Trends | |
| **Week - 2** | | Introduction to Workflow Tools (n8n, Make, etc.): Node Logic and Basic Process Design | |
| **Week - 3** | | Smart Workflows 1: Event Triggers (Webhooks) and Schedulers (Cron Jobs) | |
| **Week - 4** | | Smart Workflows 2: API Integrations, Data Transformation, and Logical Routing | |
| **Week - 5** | | Introduction to AI Agents: The Role of Large Language Models in Automation and Decision-Making Mechanisms | |
| **Week - 6** | | Tool Usage and Function Calling: Interaction of LLMs with External Systems | |
| **Week - 7** | | Multi-Step Task Planning: Managing Chain of Tasks by Autonomous Agents | |
| **Week - 8** | | Midterm Exam | |
| **Week - 9** | | Data and Document Processing Pipelines 1: OCR, Reading Unstructured Data, and Automated Classification | |
| **Week - 10** | | Data and Document Processing Pipelines 2: Data Enrichment Processes via APIs and Web Scraping | |
| **Week - 11** | | Human Integration: Human-in-the-Loop Approach and Designing Human Approval Steps | |
| **Week - 12** | | Security Protocols and API Key Management: Protecting Sensitive Data and Authorization Strategies | |
| **Week - 13** | | Cost Analysis and Optimization: Token Management, Rate Limiting, and Resource Efficiency | |
| **Week - 14** | | Project Studies: Real-World Applications of Sectoral Automation Scenarios and End-of-Term Presentations | |

## Learning Outcomes

| # | Learning Outcome |
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| 1 | Upon successful completion of this course, students will gain the competence to design smart processes with event triggers and schedulers on modern workflow tools like n8n by laying the foundations of automation and orchestration concepts; configure large language models (LLMs) as autonomous AI agents with function calling and tool usage capabilities; plan complex multi-step tasks by automating document processing and data enrichment pipelines; and end-to-end develop real-world sectoral automation projects that comply with data security, API authorization, and cost analysis standards by adding human approval (human-in-the-loop) steps to these background processes. |

## Sustainable Development Goals

*No content has been provided.*

## Course Theme

*No content has been provided.*

## AKTS Workload

| Activity | Duration (Hour) | Count | Workload |
|---|---|---|---|
| Teorik Derse Katılım | 0 | 0 | 0 |
| Sınıf Dışı Çalışma (Ön Hazırlık & Pekiştirme Amaçlı) | 0 | 0 | 0 |
| Ödevler | 0 | 0 | 0 |
| Proje - Rapor - Sunum Hazırlama | 0 | 0 | 0 |
| Ara Sınav Hazırlığı (sınav süresi dahil) | 0 | 0 | 0 |
| Final Sınavı Hazırlığı (sınav süresi dahil) | 0 | 0 | 0 |
| Uygulama (Laboratuvar, Müzik/Enstrüman Uygulaması, Atölye/Saha Çalışması vb.) | 0 | 0 | 0 |
| Staj Uygulaması | 0 | 0 | 0 |
| | | **Calculated ECTS** | **0** |

## Assessment Method and Passing Requirements

*No content has been provided.*