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| **Faculty Information** | **Name** | Nyoman Bogi Aditya Karna |
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| **Course Information** | **Class No.** | TBA | **Course Code** | TBA | **Credits** | 3 |
| **Course Name** | From Microprocessor to Intelligent IoT |
| **Lecture Schedule** | Mon-Fri / 09:00~12:00 & 13:00 ~ 15:00 |
| **Course Description** | This workshop-style course offers students the chance to get hands-on with real devices. Starting with the basics of AVR microprocessors and their application in the ATmega328 microcontroller, students will then move on to building their own IoT systems. Each participant will use a real IoT device and enhance it with AI-powered computer vision for a practical, future-ready learning experience. |
| **Course Objective** | * Students should be able to explain how a microprocessor works
* Students should be able to design and program a real IoT device, including sensors, actuator, and display
* Students should be able to use IoT Cloud for monitoring, analytics, and controlling purposes
* Students should be able to enhance the IoT device with AI features, such as object detection and face recognition
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| **Prerequisite** | Understanding of Logic Circuits and C Programming is needed but not mandatory. Creativity is mandatory. |
| **Materials/Textbooks** | 1. Jacob Millman and Arvin Grabel, “Microelectronics 2nd ed.,” McGraw-Hill, 1988
2. John L. Hennessy and David A. Patterson, “Computer Architecture: A Quantitative Approach 4th ed.,” Morgan Kaufmann, 2007
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| **Evaluation** | **Attendance** | 20% | **Quiz** | 0% |
| **Assignment** | 0% | **Mid-term Exam** | 20% |
| **Presentation** | 0% | **Final Exam** | 0% |
| **Group Project** | 60% | **Participation** | 0% |
| **Etc.** | **Evaluation Item** | **Ratio** |
|  | % |
|  | % |
| **Daily** **Lecture Plan** | Day 1 | Story of Microprocessor and How it Works |
| Day 2 | Microprocessor, Memory, and Input/Output Interaction |
| Day 3 | Machine Instruction |
| Day 4 | Programming Arduino Uno (using simulator TinkerCAD.com) |
| Day 5 | Mid Exam + Introducing NodeMCU ESP8266 and ESP32 Cam |
| Day 6 | Programming NodeMCU ESP8266 with Sensors, Actuators, and LCD Display |
| Day 7 | Build Your Own IoT Cloud for Monitoring and Controlling |
| Day 8 | Programming ESP32 Cam for Computer Vision |
| Day 9 | Project Presentation |