EE3032 Module Learning Outcomes (MLOs) and Assessment Plan

	Module Learning Outcomes	Assessment Plan
1	System specifications: a) Formulate from loosely defined requirements the technical and performance specifications for a system. b) Carry out Top-Down design approach of the system (system block diagrams, circuit schematics & process flow charts) based on the technical and performance specifications.	• Initial system specifications-Paper design (Wiki) • Design & Integration (planning & originality)
2	Understand and consider environmental, economic and societal impacts and sustainability of solution proposed.	• Concept of design excellence (Wiki)
3	System design: a) Carry out systematic design of sub-systems from a system level design. b) Execute design for interconnection of various subsystems c) Make design decisions including: whether to implement in hardware or software, choice of design method, choice of components or programming language. d) Make trade-offs between function, cost, size, and user-friendliness. e) Demonstrate that the system implementation meets the design specifications.	• Hardware & software integration (subsystem effectiveness & robustness) • Subsystem specific criteria • Proof/implementation of design excellence • PCB design & wiring (feature working) • Hardware & software implementation (devices calibration & control, program flow, system robustness & intelligence) • Design & integration (project usefulness, user-friendliness) • Project specific criteria

4	Technical skills: a) Use engineering tools in workshop and apply skills such as soldering b) Use engineering software tools such as programming language editor, compiler, debugger; PCB design software etc. c) Apply design methods, bread-boarding or programming as appropriate, perform tests and debugging.	• Technical quiz • Breadboard prototyping & coding (flow chart, pin allocation table, schematics, codes & circuit patching) • PCB design & wiring (schematics, pcb layouts, circuits separation, labeling, connections, board modularization, borders, power tracks, following guidelines, routing, bends, soldering, connectors, headers & sockets, ribbon cables, SIL sockets, jumpers) • Design & integration (workmanship & meeting size constraint)
5	Understand and recognize the potential electrical and mechanical safety hazards and how to react during emergency.	An online quiz on laboratory safety and awareness.
6	Work as a member of a team to realize a complete electronic system.	Reviewed by TA and peer review using the assessment sheets throughout the project implementation.
7	Apply principles of project management such as time-scheduling, work scheduling and resource management while carrying out the project.	• Initial system specifications-Gantt chart and resource allocation. • Timely completion – Breadboard prototyping & coding • Timely completion – PCB design & wiring
8	Continuously document the design and development process in a portfolio.	Project documentation (Wiki: individual learning journal & project portfolio)
9	Able to deliver technical presentations that are clear, have a logical structure and are engaging.	Project presentation (clear & concise explanation, effective use of slides/prototype, keep to time)