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| PO1 | Apply knowledge of mathematics, natural science, engineering fundamentals and specialization in Software Engineering to the solution of complex engineering problems; |
| PO2 | Identify, formulate, survey research literature and analyze complex Software engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences; |
| PO3 | Design solutions for complex Software engineering problems and design systems, components or processes that meet specified needs; |
| PO4 | Conduct investigations of complex Software engineering problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions; |
| PO5 | Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex Software engineering problems, with an understanding of the limitations; |
| PO6 | Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex Software engineering problems; |
| PO7 | Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex Software engineering problems in environmental contexts; |
| PO8 | Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice; |
| PO9 | Communicate effectively on complex Software engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions; |
| PO10 | Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings; |
| PO11 | Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change; |
| PO12 | Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to manage projects; |

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| LO1-MA | Describe the underlying theoretical basis of the relational database model and motivations |
| LO2-MA | Design a relational database model based on the underlying theoretical basis with the capability of evaluating different options |
| LO3-MA | Implement a database based on a sound database design with constructing queries that meet user requirements |
| LO4-MA | Contrast the differences between non-relational database models and the relational database model. |
| LO5-MA | Develop programming structures within a database backend. |
| LO1-MA | Discuss requirements of a smart system from component to integrated perspective. |
| LO2-MA | Define programs using Python, discern problem-solving strategies in decomposing problems using algorithms and describe software engineering processes. |
| LO3-MA | Select fundamental circuit analysis techniques to solve problems in circuits that contain common electrical and electronic components. |
| LO4-MA | Propose a design solution in response to a given scenario through requirements and functional analysis, evaluate that solution from an integrated system perspective. |
| LO5-MA | Identify appropriate engineering tools and techniques to develop and validate a solution. |
| LO6-MA | Identify the ethical considerations of data collection and analysis in engineering designs that may impact the suitability of solutions. |
| LO7-MA | Describe project progress and outputs to stakeholders in review meetings, demonstrations and documentation. |
| LO8-MA | Identify roles and responsibilities within a team and reflect on self and team behaviours that contribute to the successful conduct of a project. |
| LO1-MA | Discern fundamental chemical, materials, mechanical and environmental engineering knowledge, principles and concepts to propose solutions to a humanitarian engineering problem. |
| LO2-MA | Identify design requirements from a provided brief and analyse potential solutions using first principles of mathematics and natural and engineering sciences. |
| LO3-MA | Identify societal, health, safety, legal and cultural issues relevant to your project including the Indigenous context, and your consequent responsibilities as an engineer. |
| LO4-MA | Determine appropriate principles of sustainable design and development, including embodied energy, renewable materials, availability, costs, etc, of a proposed solution using a systems approach to design. |
| LO5-MA | Discern the ethical considerations of working with diverse communities and stakeholders, and demonstrate your commitment to the Engineers Australia Code of Ethics and/or the Board of Engineers Malaysia Code of Professional Conduct, and established norms of professional conduct throughout your project. |
| LO6-MA | Describe project progress and outputs to stakeholders verbally through pitches, in writing through professional engineering documentation, and graphically through drawings and visualisations. |
| LO7-MA | Describe the principles of team norms, collaboration and dynamics, define your professional practice goals and discern the practices that lead to successful teamwork in a multicultural context. |
| LO1-MA | design and implement a software system of a quality acceptable to an external client |
| LO2-MA | select and use appropriate tools, techniques and strategies to manage project resources,  including time and personnel |
| LO3-MA | identify potential sources of risk, including ethical risk, and devise and adopt appropriate strategies to monitor and mitigate these risks |
| LO4-MA | choose and follow a software development methodology that is appropriate to the team, project and client, and justify this methodology |
| LO5-MA | elicit requirements from client representatives and ensure that these are communicated to team members and other stakeholders in an appropriate form |
| LO6-MA | produce internal documentation of a sufficient quality to support project development  activities (including specification, analysis, design, testing); |
| LO7-MA | communicate effectively with other project stakeholders, including clients, end users, and supervisors |
| LO8-MA | verify systematically that internal and external project deliverables meet agreed quality  standards |
| LO9-MA | produce external documentation of a sufficient quality to meet the needs of clients, end users, and client-site technical staff. |
| LO1-MA | Analyse general problem solving strategies and algorithmic paradigms |
| LO2-MA | Prove correctness of programs, analyse their space and time complexities. |
| LO3-MA | Compare and contrast various abstract data types and use them appropriately. |
| LO4-MA | Develop and implement algorithms to solve computational problems. |
| LO1-MA | Determine reactions and internal member forces in simple truss and beam systems and carry out limit state design to select appropriately sized members. |
| LO2-MA | Determine the strength of structural materials to inform engineering designs with considerations to performance. cost, sustainability and societal impact. |
| LO3-MA | Determine the steady-state performance of simple systems involving levers, gears, springs and pulleys using appropriate engineering problem-solving methodologies. |
| LO4-MA | Analyse concept designs that solve engineering problems and justify finalised design with considerations of key variables, assumptions, and system boundaries. |
| LO5-MA | Propose concept designs and develop a final design which balances competing requirements. |
| LO6-MA | Identify appropriate engineering tools and techniques to develop, validate and convey designs and solutions. |
| LO7-MA | Identify roles and responsibilities within a team and reflect on self and team behaviours that contribute to the successful conduct of a project. |
| LO1-MA | Apply suitable mathematical techniques to solve problems involving linear algebra, multi-variable calculus and ordinary differential equations. |
| LO1-MA | Design object-oriented solutions for small to medium-size systems using standard software engineering notations such as UML diagrams. (C5) |
| LO2-MA | Develop object-oriented designs in an object-oriented programming language such as Java, using object-oriented programming constructs such as classes, inheritance, abstract classes, and generics. (C5). |
| LO3-MA | Apply available language tools, such as debuggers and profilers, and good programming practice to debug their implementations systematically and efficiently. (C3) |
| LO4-MA | Evaluate the quality of object-oriented software designs both in terms of meeting user requirements and in terms of good design principles, using appropriate domain vocabulary. (C6) |
| LO1-MA | Apply knowledge of networking fundamentals, and advanced networking knowledge appropriate to solve complex networking problems and network design problems (C3) |
| LO2-MA | Analyse the computer network problems from different layers of Internet model using appropriate mechanism (C4) |
| LO3-MA | Design wired and/or wireless networks that can optimise network performance subject to various resource constraints (C6) |
| LO4-MA | Select and use appropriate techniques and software tools to investigate complex computer networking related practical problems |
| LO1-MA | Analyse simple logic circuits; |
| LO2-MA | Explain and analyse key processor components; |
| LO3-MA | Explain and analyse computer organisation; |
| LO4-MA | Write and debug simple assembly language programs; |
| LO5-MA | Use simulator programs to model computer system components. |
| LO1-MA | Apply engineering fundamentals to design a mechatronics system. |
| LO2-MA | Design a complex mechatronics system that meets design requirements. |
| LO3-MA | Propose an appropriate design methodology to achieve design requirements. |
| LO4-MA | Identify and use appropriate techniques, resources and modern engineering tools to achieve the design requirements. |
| LO5-MA | Justify technical details of a mechatronics solution(s) in written and oral forms. |
| LO6-MA | Demonstrate the ability to work effectively as a member or leader in a diverse team. |
| LO7-MA | Manage a project and drive it to successful completion. |
| LO8-MA | Demonstrate an understanding of the motivation for engineers to carry out mechatronics design. |
| LO1-MA | Carry out investigations to identify suitable software quality and quality assurance measures, including human review and inspection of code and non-code artifacts, as well as execution-based testing |
| LO2-MA | Apply specific and appropriate quality goals for a moderately-sized software development project, select an appropriate quality assurance strategy to give confidence that these quality goals can be achieved, and document this strategy appropriately in the context of a software process model |
| LO3-MA | Perform systematic, automated unit testing on source code modules, using both specification-based and code-based approaches, utilising automated testing frameworks, including faking and mocking tools |
| LO1-MA | evaluate different strategies for solving and translating problem statements into algorithms and implement them in a high level programming language. |
| LO2-MA | summarise, compare, design, and theoretically and experimentally evaluate different algorithms and implementations of basic abstract data types such as stacks, queues, lists, trees, priority queues, heaps and hash tables. |
| LO3-MA | analyse algorithms by determining their best/worst case big O time complexity and recognize their limitations, both theoretical and practical. |
| LO4-MA | deconstruct simple high-level code into assembly code such as MIPS R2000 |
| LO1-MA | Model and design flexible software at the architectural level using various tools and techniques; |
| LO2-MA | Analyse and design software systems taking into consideration various quality attributes and requirements; |
| LO3-MA | Analyse, identify, and take requirements for simple systems and develop software architectures and designs at a high level |
| LO4-MA | Identify and use configuration management tools effectively |
| LO5-MA | Apply a variety of design patterns, frameworks and architectures in designing software; |
| LO6-MA | Identify, locate and use off-the-shelf components in the construction of software. |
| LO1-MA | Describe industry-standard team-based project management methodologies and apply them across a multi-functional team to achieve optimal project progress |
| LO2-MA | Plan and manage the full range of activities in a software engineering project in accordance with the development methodology |
| LO3-MA | Apply soft skills when engaging stakeholders in a consistent and professional manner to determine functional and non-functional requirements |
| LO4-MA | Identify aspects of quality that are important in the context of the project, and devise and implement strategies for ensuring quality goals are met; |
| LO5-MA | Compare and analyse appropriate industry-standard technologies to determine the optimal combination of software required to support project development |
| LO6-MA | Analyse and deliberate professional issues occurring within the development and deployment of software applications, and identify appropriate actions based on relevant law and industry codes of ethical behaviour |
| LO1-MA | Apply project evaluation techniques including the triple bottom line against the overall business model and identify the elements of the project life cycle, including planning, controlling, and organizing to allocate resources. |
| LO2-MA | Evaluate and apply the basic tools and techniques to plan, organize, and manage a project and Identify strategic constraints in managing the scope, time, cost and quality components. |
| LO3-MA | Evaluate the interconnection of quality, heath, safety, risk and contract management and assess the consequent responsibilities relevant to professional engineering practice. |
| LO4-MA | Understand and evaluate the need for sustainability and the impact of professional engineering work in the solution of Civil engineering problems in environmental context. |
| LO5-MA | Explain the contract laws and apply ethical principles and commit to professional ethics and responsibilities and the norms of engineering practice. |
| LO6-MA | Communicate effectively on complex Civil engineering activities with the engineering community in both oral and written form. |