# Software Engineering Stage 6 (Year 11) – sample scope and sequence



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## Rationale

All NSW public schools need to plan curriculum and develop teaching programs consistent with the *Education Act 1990* (NSW) and the NSW Education Standards Authority (NESA) syllabuses and credentialing requirements.

Scope and sequences form part of the ongoing documentation or evidence schools maintain to comply with the department’s policy, policy standards, and registration requirements.

Developing a robust scope and sequence has many benefits and may help teachers and schools to:

* promote high expectations for student learning
* identify opportunities for explicit teaching
* create opportunities for students to receive feedback on their learning
* systematically plan for and undertake assessment
* collect and use data to monitor achievements and identify gaps in learning
* differentiate curriculum delivery to meet the needs of students at different levels of achievement
* collaborate with other teachers to plan for quality teaching and learning.

This resource can be used as a basis for the teacher’s own program, assessment, or scope and sequence. Teachers will need to contextualise all Department of Education resources for their classroom. This sample scope and sequence has suggested timeframes that may need to be adjusted by the teacher to meet the needs of their students.

## Software Engineering Stage 6 (Year 11) – sample scope and sequence

Table 1 – Stage 6 (Year 11) – Software Engineering sample scope and sequence

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Term | Learning overview | Outcomes | Skills | Assessment |
| Term 1 | Programming Fundamentals | **SE-11-01** describes methods used to plan, develop and engineer software solutions  **SE-11-02** explains how structural elements are used to develop programming code  **SE-11-06** applies tools and resources to design, develop, manage and evaluate software  **SE-11-07** implements safe and secure programming solutions | Students are introduced to software engineering by applying computational thinking skills to develop a program. In this focus area students apply core knowledge and skills to develop project(s) that incorporate standard algorithmic structures converted into programming code.  These projects introduce the project management skills students will develop throughout the course.  Project examples include:   * the conversion of a standard board game into a computer game * designing a memory game, maze and arcade-style video game. | Programming Fundamentals project –  Term 1 Week 10 |
| Term 2 | The Object-Oriented Paradigm | **SE-11-01** describes methods used to plan, develop and engineer software solutions  **SE-11-02** explains how structural elements are used to develop programming code  **SE-11-03** describes how current hardware, software and emerging technologies influence the development of software engineering solutions  **SE-11-04** applies safe and secure practices to collect, use and store data  **SE-11-06** applies tools and resources to design, develop, manage and evaluate software  **SE-11-07** implements safe and secure programming solutions  **SE-11-08** applies language structures to refine code  **SE-11-09** manages and documents the development of a software project | Students exercise the essential skills developed in the Programming Fundamentals focus area and apply these to the specific requirements of object-oriented programming (OOP) languages.  Students apply core knowledge and skills to develop project(s) that apply the intricate skills associated with designing and programming using OOP.  Project examples include:   * a quiz-based application, stopwatch and alarm clock * a bulk file renaming tool * a simple graphic user interface (GUI) and application programming interface (API). | Formative assessment ongoing |
| Term 3 | Programming Mechatronics | **SE-11-01** describes methods used to plan, develop and engineer software solutions  **SE-11-02** explains how structural elements are used to develop programming code  **SE-11-03** describes how current hardware, software and emerging technologies influence the development of software engineering solutions  **SE-11-06** applies tools and resources to design, develop, manage and evaluate software  **SE-11-07** implements safe and secure programming solutions  **SE-11-08** applies language structures to refine code  **SE-11-09** manages and documents the development of a software project | Students extend the learning experienced through the Programming Fundamentals and The Object-Oriented Paradigm focus areas to develop project(s) by building and programming a mechatronic system using a range of sensors, actuators and end effectors.  Projects explore the use and application of robotics, controllers and the programming of these devices. Students apply the coding skills developed in the previous focus areas. | Blended object-oriented programming/ mechatronics project –  Term 3 Week 5  Yearly Examination –  Term 3 Weeks 9–10 |

## Support and alignment

**Resource evaluation and support:** all curriculum resources are prepared through a rigorous process. Resources are periodically reviewed as part of our ongoing evaluation plan to ensure currency, relevance and effectiveness. For additional support or advice, contact the TAS curriculum team by emailing TAS[@det.nsw.edu.au](mailto:Science7-12@det.nsw.edu.au).

**Alignment to system priorities and/or needs:** [School Excellence Policy](https://education.nsw.gov.au/policy-library/policies/pd-2016-0468), [School Success Model](https://education.nsw.gov.au/public-schools/school-success-model/school-success-model-explained)

**Alignment to the School Excellence Framework:** this resource supports the [School Excellence Framework](https://education.nsw.gov.au/teaching-and-learning/school-excellence-and-accountability/sef-evidence-guide/resources/about-sef) elements of curriculum (curriculum provision, teaching and learning programs) and effective classroom practice (lesson planning).

**Alignment to Australian Professional Teaching Standards:** this resource supports teachers to address [Australian Professional Teaching Standards](https://educationstandards.nsw.edu.au/wps/portal/nesa/teacher-accreditation/meeting-requirements/the-standards/proficient-teacher) 2.2.2, 3.2.2.

**Consulted with:** Curriculum and Reform and subject matter experts

**NSW syllabus:** [Software Engineering 11–12 Syllabus](https://curriculum.nsw.edu.au/syllabuses/software-engineering-11-12-2022)

**Syllabus outcomes:** SE-11-01, SE-11-02, SE-11-03, SE-11-04, SE-11-05, SE-11-06, SE-11-07, SE-11-08, SE-11-09

**Author:** TAS Curriculum Support Team

**Publisher:** State of NSW, Department of Education

**Resource:** scope and sequence

**Related resources:** further resources to support Stage 6 Software Engineering can be found on the [TAS curriculum website.](https://education.nsw.gov.au/teaching-and-learning/curriculum/tas/stage-6)

**Professional learning:** relevant professional learning is available through the [TAS statewide staffroom](https://teams.microsoft.com/l/team/19%3acd41312b69a14cd38a7c429ffd90493a%40thread.tacv2/conversations?groupId=cd5a04e1-7742-47dd-b141-9519486d9e00&tenantId=05a0e69a-418a-47c1-9c25-9387261bf991).

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## Evidence base

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[Software Engineering 11–12 Syllabus](https://curriculum.nsw.edu.au/syllabuses/software-engineering-11-12-2022) © NSW Education Standards Authority (NESA) for and on behalf of the Crown in right of the State of New South Wales, 2022.

NESA (NSW Education Standards Authority) (2021) ‘[Advice on scope and sequences](https://www.educationstandards.nsw.edu.au/wps/portal/nesa/k-10/understanding-the-curriculum/programming/advice-on-scope-and-sequences)’, Programming, NESA website, accessed 29 August 2022.

State of New South Wales (Department of Education) (2022) ‘[Differentiating learning](https://education.nsw.gov.au/teaching-and-learning/professional-learning/teacher-quality-and-accreditation/strong-start-great-teachers/refining-practice/differentiating-learning)’, Refining practice, NSW Department of Education website, accessed 29 August 2022.

Wiliam D (2013) ‘[Assessment: The bridge between teaching and learning](https://www.researchgate.net/publication/258423377_Assessment_The_bridge_between_teaching_and_learning)’, *Voices from the Middle*, 21(2):15–20, accessed 29 August 2022.

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