

# Next Generation Higher National Unit Grading Pack

## Higher National Diploma Software Development

Qualification code: GV22 48

Valid from: session 2024 to 2025

**Prototype for pilot delivery only**

This grading pack provides information about the process of grading the Higher National Diploma (HND) Software Development. It is for lecturers and assessors, and contains all the mandatory information you need to grade the HND.

You must read it alongside the Educator Guide.

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Draft

# Approach to grading

Grading in Next Generation: Higher National (NextGen: HN) Qualifications produces a valid and reliable record of a learner's level of achievement across the breadth of the qualification content.

As well as grading the whole qualification, you assess individual units on a pass or fail basis. Each unit has evidence requirements that learners must achieve before you can consider them for whole-qualification grading.

## Whole-qualification grade outcomes

Learners who pass NextGen: HN Qualifications receive one of the following grade outcomes for the qualification as a whole:

- Achieved with Distinction
- Achieved with Merit
- Achieved

To determine a learner's whole-qualification grade, you use the grading matrix to assess and judge their performance across the key aspects of the HND. You must align your judgements with the following whole-qualification grade descriptors.

## Whole-qualification grade descriptors

### Achieved with Distinction

The learner has achieved an excellent standard across the course content, going significantly beyond meeting the qualification requirements. They showed a comprehensive knowledge and understanding of course concepts and principles, and consistently used them to apply skills to complete high-quality work. They engaged

significantly with the process of developing their meta-skills in the context of their HN Qualification.

### **Achieved with Merit**

The learner has achieved a very good standard across the course content, going beyond meeting the qualification requirements. They showed a very good knowledge and understanding of course concepts and principles, and consistently used them to apply skills to complete work of a standard above that expected for an Achieved grade. They actively engaged with the process of developing their meta-skills in the context of their HN Qualification.

### **Achieved**

The learner has achieved a good standard across the course content, credibly meeting the qualification requirements. They showed a good knowledge and understanding of course concepts and principles, and used them to apply skills to complete work of the required standard. They engaged with the process of developing their meta-skills in the context of their HN Qualification.

## **What the whole-qualification grade descriptors do and how they are used**

The whole-qualification grade descriptors outline the skills, knowledge and understanding a learner needs to show across the whole qualification to achieve that specific grade. They align with the Scottish Credit and Qualifications Framework (SCQF) level descriptors.

NextGen: HND qualifications are at SCQF level 8. Learners who complete a NextGen: HND can:

- convey an insightful understanding of the subject's core theories, concepts and principles, along with its scope and defining features
- apply skills, knowledge and understanding of the subject in relevant practical and professional contexts, showing some specialist knowledge and using a range of relevant techniques and materials
- describe and explain significant topical issues and specific areas of interest
- exercise autonomy and initiative in carrying out activities, and have developed their professional practice and behaviours relevant to the context of the qualification
- formulate and critically evaluate evidence-based responses to issues in the context of the subject area, appropriately applying research and academic processes

Please use this information, as well as the whole-qualification grade descriptors, to help you understand the standard at which learners should be assessed and graded.

Higher education institutes (HEIs) can use the grade descriptors to set admissions requirements, and employers can use them to help make decisions during a recruitment process.

SQA's quality assurance teams use the grade descriptors and the grading matrix to ensure that grades awarded in a particular NextGen: HN Qualification are at a consistent national standard, regardless of the setting in which they are achieved.

Successful learners receive their grade, along with the grade descriptor, on their certificate.

## Using the grading matrix

You must use the grading matrix to judge the learner's whole-qualification grade. You can use the grading matrix at any time, but you only make a whole-qualification grading judgement when you are confident the learner has met all the evidence requirements of all the required units.

The criteria in the grading matrix reflect the knowledge, skills and qualities HEIs and employers can expect of a learner who has completed the qualification. These criteria align with the overall purpose of the qualification, and remain the same for its duration.

Each criterion has sector-specific descriptors of a typical learner's performance standard, aligned to the whole-qualification grade outcomes of Achieved, Achieved with Merit and Achieved with Distinction. These descriptors describe the standard a learner of that whole-qualification grade is expected to show.

The guidance accompanying each criterion can include, but is not limited to, information on:

- relevant types of assessment that may produce useful or meaningful evidence for judging that criterion
- mapping to content that is particularly relevant to that criterion
- mapping to meta-skills

This guidance may be updated over time.

When you make your final grading judgement, you must use a 'best fit' approach based on the learner's achievement across the grading matrix. This may be straightforward — for example, if the learner's evidence shows a consistent standard across the grading matrix criteria. If it is not straightforward, you must make a 'best fit' judgement — for example, if a learner shows a mix of standards across the grading matrix criteria, with no clear pattern. The criteria may not always have equal value. You can decide some are more important to the final grade than others.

## **Meta-skills**

Meta-skills are a key part of NextGen: HN Qualifications and learners can develop them throughout the qualification. A learner's engagement with developing their own meta-skills contributes to their qualification grade. You do not assess or grade competence or progress in individual meta-skills — for example, by judging the quality of a learner's feeling or creativity. Instead, you look at the process of development learners go through. This means learners need to provide evidence of planning, developing and reflecting on their meta-skills.

If qualification content also contributes to meta-skills development, it contributes to a learner's whole-qualification grading through the grading matrix approach.

## **Learning for Sustainability**

Learning for Sustainability does not contribute to a learner's qualification grade.

If qualification content is also Learning for Sustainability content, it does contribute to a learner's whole-qualification grade through the grading matrix approach.

## Grading matrix

Criterion 1	Achieved	Merit	Distinction
<p><b>Demonstrate knowledge of concepts relating to software development</b></p>	<p>The learner:</p> <ul style="list-style-type: none"> <li>• provides a basic explanation of object-oriented design (OOD) and object-oriented programming (OOP) concepts</li> <li>• provides a basic description of programming techniques, such as decomposition, abstraction and modularity</li> <li>• demonstrates adequate knowledge of the syntax, semantics and constructs of a programming language</li> <li>• demonstrates adequate knowledge of the software development life cycle (SDLC) and some software development methods</li> <li>• demonstrates adequate knowledge of programming standards, such as code style and security</li> </ul>	<p>The learner:</p> <ul style="list-style-type: none"> <li>• provides a clear explanation of OOD and OOP concepts and outlines their benefits over other designs</li> <li>• provides a clear description of programming techniques such as decomposition, abstraction and modularity</li> <li>• demonstrates sound knowledge of the syntax, semantics and constructs of one or more programming languages</li> <li>• demonstrates sound knowledge of the SDLC and compares the benefits of two or more software development methods</li> </ul>	<p>The learner:</p> <ul style="list-style-type: none"> <li>• provides a detailed clear explanation of OOD and OOP concepts and fully describes their benefits over other designs</li> <li>• provides a detailed clear description of programming techniques such as decomposition, abstraction and modularity and explains their benefits</li> <li>• demonstrates sound knowledge of the syntax, semantics and constructs two or more programming languages and describes their use cases</li> </ul>



Criterion 1	Achieved	Merit	Distinction
<p><b>Demonstrate knowledge of concepts relating to software development (continued)</b></p>	<p>The learner:</p> <ul style="list-style-type: none"> <li>• demonstrates adequate knowledge of algorithms and their use cases</li> <li>• selects and uses appropriate data structures in creating software solutions</li> <li>• provides an adequate explanation of the goals and principles of test-driven development</li> <li>• provides an adequate explanation of version control and its benefits to software development</li> </ul>	<p>The learner:</p> <ul style="list-style-type: none"> <li>• demonstrates a sound understanding of programming standards such as code style, security and quality</li> <li>• demonstrates sound knowledge of algorithms by outlining how they work and their use cases</li> <li>• selects, justifies and uses appropriate data structures in creating software solutions</li> <li>• provides a clear explanation of the goals and principles of test-driven development and the several levels of testing</li> <li>• provides a clear explanation of version control and its benefits to software development</li> </ul>	<p>The learner:</p> <ul style="list-style-type: none"> <li>• demonstrates a clear and detailed understanding of the SDLC and compares and contrasts the risks and benefits of two or more software development methods</li> <li>• demonstrates a clear and detailed understanding of programming standards such as code style, security and quality and explains their benefits</li> <li>• demonstrates detailed knowledge of algorithms by describing how they work, their use cases and their space/time complexity</li> </ul>

Criterion 1	Achieved	Merit	Distinction
<b>Demonstrate knowledge of concepts relating to software development (continued)</b>			<p>The learner:</p> <ul style="list-style-type: none"> <li>• selects, justifies and efficiently uses highly appropriate data structures in creating software solutions</li> <li>• provides a detailed clear explanation of the goals and principles of test-driven development and compares the several levels of testing</li> <li>• provides a detailed clear explanation of version control, the risks of not doing it, and its benefits to software development</li> </ul>

## Guidance

This criterion requires learners to demonstrate their understanding of foundational programming concepts. The rubrics benchmark learners' ability to articulate, analyse, and apply their conceptual understanding through description, discussion, justification, and critical evaluation of the programming fundamentals they need to develop software solutions. The criterion reflects the requirement for methodical and systematic approaches to software development through modern and traditional models for managing the development cycle:

- The mandatory Software Development unit covers data structures, algorithms, testing, debugging, and design patterns. It also includes an understanding of software development processes.
- The Professional Practice in Software Development (project) unit allows learners to demonstrate programming knowledge in practice, through deliverables and applying methodologies in a team project.
- The Software Engineering Methods unit provides comprehensive coverage of software engineering models and methodologies.
- The Application Development for Web unit requires learners to follow development models for web applications.
- The Application Development for Web and Human Computer Interface units provide learners with an opportunity to evidence their understanding of interface design and its processes.

Criterion 2	Achieved	Merit	Distinction
<b>Design and develop software</b>	<p>The learner:</p> <ul style="list-style-type: none"> <li>• creates a software requirements specification that adequately identifies the problem to be solved</li> <li>• selects and implements an appropriate methodology to guide the development process</li> <li>• creates a software design document that describes the architecture of the solution and its data structures</li> <li>• writes source code that correctly implements a software design and demonstrates good coding practices</li> <li>• selects and uses software development tools for coding and debugging</li> </ul>	<p>The learner:</p> <ul style="list-style-type: none"> <li>• creates a software requirements specification that identifies the problem to be solved and specifies the requirements for the solution</li> <li>• selects, justifies and implements an appropriate methodology to guide the development process</li> <li>• creates a clear software design document that correctly describes the architecture of the solution and its data structures</li> <li>• writes source code that correctly and efficiently implements a software design and demonstrates competence in coding practice</li> </ul>	<p>The learner:</p> <ul style="list-style-type: none"> <li>• creates a software requirements specification that identifies the problem to be solved, specifies the requirements for the solution and identifies the constraints on the solution</li> <li>• selects, justifies and demonstrates competence in implementing a highly appropriate methodology to guide the development process</li> <li>• creates a detailed, clear software design document that fully describes the architecture of the solution, its data structures and the user interface</li> </ul>

Criterion 2	Achieved	Merit	Distinction
<b>Design and develop software (continued)</b>	<p>The learner:</p> <ul style="list-style-type: none"> <li>creates a project plan and meets most milestones in its execution</li> </ul>	<p>The learner:</p> <ul style="list-style-type: none"> <li>selects, justifies and efficiently uses software development tools for coding and debugging</li> <li>creates a clear project plan and adheres to it, meeting all milestones</li> </ul>	<p>The learner:</p> <ul style="list-style-type: none"> <li>writes source code that correctly and efficiently implements a software design and demonstrates a high level of competence in coding practice</li> <li>selects, justifies and efficiently uses an appropriate range of software development tools for coding and debugging</li> <li>creates a clear and detailed project plan and successfully executes it, with all milestones delivered in a timely way</li> </ul>

## Guidance

This criterion reflects the software development activities and processes necessary for the establishment of the client (end-user) requirements, documenting them and developing use cases to guide solution development. The requirements must be validated.

- The Professional Practice in Software Development unit expects learners to create a user requirements specification in a team project.
- The Software Development unit asks learners to carry out a user requirements analysis.
- The Application Development for Web unit covers a requirements analysis for web applications.
- The Software Engineering Methods unit covers an extensive requirements analysis.
- The Event-Driven Programming unit covers identifying requirements for user interfaces (UIs).

Criterion 3	Achieved	Merit	Distinction
<p><b>Test, deploy and document software</b></p>	<p>The learner:</p> <ul style="list-style-type: none"> <li>• creates and implements a test plan that confirms that the solution satisfies the software requirement specification</li> <li>• creates and executes a plan that outlines the steps to deploy the software to a target system</li> <li>• demonstrates security practices through code inspections, authentication and authorisation</li> <li>• creates technical and user documentation to an adequate standard</li> </ul>	<p>The learner:</p> <ul style="list-style-type: none"> <li>• creates, justifies and implements a test plan that confirms that the solution satisfies the software requirement specification</li> <li>• creates, documents and executes a clear plan for deployment of the software to a target system</li> <li>• demonstrates good security practices to protect data through code inspection, encryption, authentication and authorisation</li> <li>• creates technical and user documentation that is clear, concise and easy to understand</li> </ul>	<p>The learner:</p> <ul style="list-style-type: none"> <li>• creates, justifies and implements a comprehensive test plan that verifies that the solution correctly satisfies the software requirement specification</li> <li>• creates a detailed, clear plan for deployment that includes instructions for installing and configuring the software on a target system and executes it efficiently</li> <li>• demonstrates best security practices to protect data through code inspection and analysis, encryption, authentication and authorisation</li> <li>• creates technical and user documentation that is comprehensive, clear and easy to understand</li> </ul>

## Guidance

This criterion reflects the software development processes needed to design software solutions, the production of program code in accordance with that design, and the testing of the solution to ensure robustness and accuracy:

- The Software Development unit covers object-oriented development and following best practices. Learners develop robust applications using various languages, frameworks and tools.
- The Professional Practice in Software Development unit team project develops learners' use of software development processes.
- The Application Development for Web unit covers full-stack web solution design and development.
- The Software Engineering Methods unit covers software design, patterns, and principles.
- The Code Security unit covers secure coding practices.
- The Database Design and Development unit covers designing and implementing databases.
- The Event-Driven Programming unit covers front-end development with events and UIs.
- The Programming for Data unit covers languages and tools for data analysis.



Criterion 4	Achieved	Merit	Distinction
<p><b>Collaborate and communicate in a team context</b></p>	<p>The learner:</p> <ul style="list-style-type: none"> <li>• communicates adequately with team members, using appropriate channels, tools, and language</li> <li>• collaborates with team members by giving and receiving feedback, and contributing to solutions</li> <li>• contributes actively to the team's tasks and decisions, by sharing ideas, knowledge, and skills</li> <li>• reflects on their own and their team's performance, strengths and weaknesses, and identifies areas for improvement</li> </ul>	<p>The learner:</p> <ul style="list-style-type: none"> <li>• communicates effectively and respectfully with team members, using appropriate channels, tools, and language</li> <li>• collaborates creatively with team members, by giving and receiving feedback and generating solutions</li> <li>• contributes actively and constructively to the team's tasks, goals, and decisions, freely sharing ideas, knowledge, and skills</li> <li>• reflects on their own and their team's performance, strengths, and weaknesses, and identifies actions for improvement</li> </ul>	<p>The learner:</p> <ul style="list-style-type: none"> <li>• communicates very effectively and respectfully with their team members, using appropriate channels, tools, and language</li> <li>• collaborates creatively and critically with team members, by giving and receiving feedback, resolving conflicts, and generating solutions</li> <li>• demonstrates leadership in contributing actively and constructively to the team's tasks, goals, and decisions, by sharing ideas, knowledge, and skills</li> <li>• reflects critically on their own and their team's performance, strengths, and weaknesses, and identifies and initiates actions for improvement</li> </ul>

## Guidance

This criterion reflects the professional attitudes and behaviours that we expect of a software developer, including a commitment to adhering to best practice, planning and managing work schedules, and seeking continuous improvement. It also relates to software development being a team process, requiring collaboration and communication skills. We expect collaboration between individuals, professionals and groups, but you should also consider other forms of collaboration:

- The Professional Practice in Software Development unit requires extensive teamwork, and learners must develop professional project practices.
- The Software Development unit group projects and code reviews require meticulous analysis, design, and documentation. Learners gain new skills and cover new technologies.
- The Application Development for Web unit requires learners to collaborate in web development. They demonstrate careful analysis, design, and document creation for web applications.
- The Event-Driven Programming unit requires group learning.
- The Software Engineering Methods unit requires learners to follow rigorous software engineering processes.

Criterion 5	Achieved	Merit	Distinction
<p><b>Demonstrate regard for legal requirements and consideration of ethical and sustainability issues</b></p>	<p>The learner:</p> <ul style="list-style-type: none"> <li>• complies with organisational policies and guidelines in their work</li> <li>• identifies and complies with the relevant laws, regulations, and standards, such as data protection, intellectual property, and cyber security</li> <li>• respects the rights, interests, and perspectives of different stakeholders, such as college staff, peers and other learners, and seeks to balance them in a fair and inclusive manner</li> <li>• reflects on the ethical and social implications of their actions and decisions, and considers the potential benefits and harms for themselves, others, and the environment</li> </ul>	<p>The learner:</p> <ul style="list-style-type: none"> <li>• evaluates the ethical implications of professional activities</li> <li>• identifies and complies with the relevant laws, regulations, and standards such as data protection, intellectual property, and cyber security</li> <li>• recognises and respects the rights, interests, and perspectives of different stakeholders, such as college staff, peers and other learners, and seeks to balance them</li> <li>• evaluates and reflects on the ethical and social implications of their actions and decisions, and considers the potential benefits and harms for themselves, others, and the environment</li> </ul>	<p>The learner:</p> <ul style="list-style-type: none"> <li>• evaluates the ethical implications of professional activities and promotes ethical behaviour</li> <li>• identifies and complies with the relevant laws, regulations, and standards that apply to their field of networking infrastructure, such as data protection, intellectual property, and cyber security</li> <li>• recognises and fully respects the rights, interests, and perspectives of different stakeholders, such as college staff, peers and other communities and seeks to balance them in a fair and inclusive manner</li> </ul>

Criterion 5	Achieved	Merit	Distinction
<p><b>Demonstrate regard for legal requirements and consideration of ethical and sustainability issues (continued)</b></p>	<p>The learner:</p> <ul style="list-style-type: none"> <li>• applies the basic principles and practices of sustainability in their work, including reducing waste and saving energy</li> </ul>	<p>The learner:</p> <ul style="list-style-type: none"> <li>• applies the principles and range of practices of sustainability in their work, including reducing waste and saving energy</li> </ul>	<p>The learner:</p> <ul style="list-style-type: none"> <li>• evaluates and critically reflects on the ethical and social implications of the actions and decisions taken by themselves and the team, and considers the potential benefits and harms for themselves, others, and the environment</li> <li>• effectively applies the principles and range of practices of sustainability in their work, including reducing waste, saving energy, and promoting innovation</li> </ul>

## Guidance

This criterion relates to learners understanding that ethically unsound software applications, such as those that promote discriminatory practices or enable unlawful activity, should not be developed. Software should also operate within the bounds of applicable legislation, such as the legal requirement for data protection and accessibility. Learners should understand the impact of software systems and applications on the environment and other aspects of sustainability, and take specific actions to minimise negative effects:

- The Software Development unit and Professional Practice in Software Development unit provides learners with opportunities to demonstrate awareness of legal, ethical and sustainability issues, and operate accordingly.
- The Event-Driven Programming unit and the Application Development for Web unit requires learners to consider legal requirements for data protection and accessibility for web development. They should design for security, and to minimise energy use.

Criterion 6	Achieved	Merit	Distinction
<p><b>Develop meta-skills</b></p>	<p>The learner adequately engages with the process of meta-skills development in the context of the qualification by:</p> <ul style="list-style-type: none"> <li>• carrying out a self-assessment of meta-skills, giving reasons for ratings or judgements made</li> <li>• setting clear and measurable goals, plus action strategies to develop meta-skills in all three categories</li> <li>• using reflective practice strategies to track progress and analyse the links between course activities, experiences, and meta-skills development</li> </ul>	<p>The learner demonstrates a clear commitment to the process of meta-skills development in the context of the qualification by:</p> <ul style="list-style-type: none"> <li>• carrying out a self-assessment of meta-skills, giving some insightful reasons for ratings or judgements made</li> <li>• setting clear and measurable goals, plus action strategies to develop meta-skills in all three categories</li> <li>• using reflective practice strategies to track progress and demonstrate some insight into the impact of their course activities and experiences on their meta-skills development</li> </ul>	<p>The learner demonstrates a strong commitment to the process of meta-skills development in the context of the qualification by:</p> <ul style="list-style-type: none"> <li>• carrying out a self-assessment of meta-skills, giving some insightful reasons for ratings or judgements made</li> <li>• setting clear and measurable goals, plus action strategies to develop meta-skills in all three categories, and updating these as required</li> <li>• using reflective practice strategies very effectively to track progress and demonstrate insight into the impact of their course activities and experiences on their meta-skills development</li> </ul>

## Guidance

Practitioners must make this judgement alongside the separate meta-skills assessment guidance. This guidance details the expectations of learners' engagement with meta-skills in the context of their particular qualification.

Competence in individual meta-skills is not being judged here, for example the quality of a learner's feeling or creativity. Rather, it is the process of development the learner goes through — planning, developing, and reflecting — that should be evidenced and assessed.

Although a meta-skills outcome is located in one unit, evidence of meta-skills development can be gathered from any activity at any time during the course. For meaningful reflection to take place, the process of meta-skills development should happen continually throughout the course. The range of contexts in which this can happen is very wide, and dependent on the sector, as well as individual preferences. Each unit signposts opportunities for meta-skills development

# Administrative information

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## History of changes

Version	Description of change	Date

Please check [SQA's website](#) to ensure you are using the most up-to-date version of this guide.

If a unit is revised:

- no new centres can be approved to offer the previous version of the unit
- centres should only enter learners for the previous version of the unit if they can complete it before its finish date

For more information on NextGen: HN Qualifications please email [nextgen@sqa.org.uk](mailto:nextgen@sqa.org.uk).