Next Generation Higher National Unit Grading Pack

Higher National Diploma Engineering

Qualification code: GV2A 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) Engineering. 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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Contents

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.

Preface

- The complexities of the HND Engineering award, with many routes to the award, mean that there needs to be a bridge between learner evidence for units and grading criteria, and that bridge needs to be consistent and transparent for all routes through the award.
- The HND Engineering award uses the holistic grading model, consisting of seven main criteria.
- This holistic model is used across other HND awards; therefore, the criteria are generic in nature.
- Centres need to align specific engineering evidence from learners, for units delivered, to the grading criteria in a manner that is transparent, consistent, and suitable for internal and external verification, giving consistently reliable results.
- Regardless of the route taken through the HND Engineering award, the intention is to prepare learners for a professional engineering career.
- The Engineering Council define key competences and commitments for all level of professional engineer, regardless of discipline.
- At HNC and HND levels there are 18 key competences grouped across 11 Engineering Council areas of learning. These professional competences reflect skills gained in HND units.
- This engineering grading matrix shows where these key competences are matched into the holistic grading model for Achieved, Merit and Distinction, providing a bridge between unit achievement and grading using Engineering Council defined areas of learning.
- Grading takes place holistically across the 12 mandatory and mandatory optional credits.
- It is recognised that not all Engineering Council areas of learning will be covered equally across all awards delivered, but the mandatory and mandatory optional credits ensure that there is a minimum set for all areas of learning.

Grading matrix

Criterion 1	Achieved	Merit	Distinction
Understanding of the holistic project's objectives **Engineering Council competence — the learner demonstrates that they:** • **identify problems and apply appropriate methods to identify causes and achieve satisfactory solutions**	The learner's project activities are in line with the criteria set out in the project briefs and meet the criteria standard. The learner: • analyses well-defined problems, reaching **satisfactory** conclusions • selects and uses **a limited range of** technical literature and other sources of information to address well-defined problems • identifies, evaluates and mitigates **a minimum range of** risks (the effects of uncertainty) associated with a well-defined project or activity	The learner's project activities are in line with the criteria set out in the project briefs and meet the criteria as being of a high standard. The learner: • analyses well-defined problems, reaching **substantiated** conclusions • selects and uses **an extended range of** technical literature and other sources of information to address well-defined problems • identifies, evaluates and mitigates **an extended range of** risks (the effects of uncertainty) associated with a well-defined project or activity	The learner's. project activities are in line with the criteria set out in the project briefs and meet the criteria as being exemplary. The learner: • analyses well-defined problems, reaching **significant substantiated** conclusions • selects and uses **a wide range of** technical literature and other sources of information to address well-defined problems • identifies, evaluates and mitigates **a wide range of** risks (the effects of uncertainty) associated with a well-defined project or activity

Criterion 1	Achieved	Merit	Distinction
Understanding of the holistic project's objectives (continued) **Engineering Council competence — the learner demonstrates that they:** • **identify problems and apply appropriate methods to identify causes and achieve satisfactory solutions**	The learner: • adopts a holistic and proportionate **satisfactory** approach to the mitigation of security risks	The learner: • adopts a holistic and proportionate **extended** approach to the mitigation of security risks	The learner: • adopts a holistic and proportionate **wide-ranging** approach to the mitigation of security risks

Guidance

This criterion may be evidenced by the mandatory Professional Practice in Engineering unit, as well as the mandatory optional units.

The largest well-defined problem is the tasks done in the mandatory Professional Practice in Engineering unit, but these will likely be enhanced by tasks in the mandatory optional units.

The range and depth of analysis leading to substantiated conclusions to well-defined problems defines the grade boundaries.

Criterion 2	Achieved	Merit	Distinction
Independent working **Engineering Council competence — the learner demonstrates that they:** • **work reliably and effectively without close supervision, to the appropriate codes of practice** • **accept responsibility for the work of themselves or others** • **accept, allocate and supervise technical and other tasks**	The learner can demonstrate the ability to work independently on some tasks. The learner: • functions **well** as an individual and as a member of a team	The learner can demonstrate the ability to work independently to a high standard on some tasks. The learner: • functions **effectively** as an individual and as a member of a team	The learner can demonstrate the ability to work independently to an exceptional standard on all tasks. The learner: • functions **effectively, showing leadership**, as an individual and as a member of a team

Guidance

This criterion may be evidenced predominately by the mandatory Professional Practice in Engineering unit, supported by the mandatory optional units.

Learners will have varying degrees of exposure to independent working throughout various course units. The most likely source of evidence will be the mandatory Professional Practice in Engineering unit supported by evidence from the mandatory optional units delivered. The range and application of independent working skills define the grade boundaries.

Criterion 3	Achieved	Merit	Distinction
Having evidence of maintaining and applying knowledge **Engineering Council competence — the learner demonstrates that they:** • **review and select appropriate techniques, procedures and methods to undertake tasks** • **use appropriate scientific, technical or engineering principles**	The learner can generally apply and use their knowledge of engineering on contextualised project activity. The learner can typically demonstrate their problem-solving abilities using mathematics and engineering skills in project activity. The learner: • applies **a minimum range of** knowledge of mathematics, statistics, natural science and engineering principles to well-defined problems • uses **appropriate** computational and analytical techniques to solve well-defined problems, recognising the limitations of the techniques employed	The learner can generally apply and use their excellent knowledge of engineering on contextualised project activity. The learner can typically demonstrate their effective problem-solving abilities using mathematics and engineering skills in project activity. The learner: • applies **an extended range of** knowledge of mathematics, statistics, natural science and engineering principles to well-defined problems • uses **an extended range of** appropriate computational and analytical techniques to solve well-defined problems, recognising the limitations of the techniques employed	The learner can consistently apply and use their outstanding knowledge of engineering topics on contextualised project activity. The learner can consistently demonstrate their creative problem-solving abilities using mathematics and engineering skills in project activity. The learner: • applies **a wide range of** knowledge of mathematics, statistics, natural science and engineering principles to well-defined problems • uses **a wide range of** appropriate computational and analytical techniques to solve well-defined problems, recognising the limitations of the techniques employed

Criterion 3	Achieved	Merit	Distinction
Having evidence of maintaining and applying knowledge (continued) **Engineering Council competence — the learner demonstrates that they:** • **review and select appropriate techniques, procedures and methods to undertake tasks** • **use appropriate scientific, technical or engineering principles**	The learner: • uses **a range of** practical laboratory and workshop skills to investigate well-defined problems • selects and applies **appropriate** materials, equipment, engineering technologies and processes, **to a minimum standard**, as given in the relevant unit specifications, to plan and undertake well-defined programmes of work	The learner: • uses **an extended range of** practical laboratory and workshop skills to investigate well-defined problems • selects and applies **an extended range** of materials, equipment, engineering technologies and processes, **to an enhanced standard**, to plan and undertake well-defined programmes of work	The learner: • uses **a wide range of** practical laboratory and workshop skills to investigate well-defined problems • selects and applies **a wide range of** materials, equipment, engineering technologies and processes, **to an exemplary standard** to plan and undertake well-defined programmes of work

Guidance

This criterion may be evidenced by the mandatory Engineering Mathematics 1 and Engineering Principles units, as well as the mandatory optional units.

The range and depth of knowledge of mathematics, statistics, natural science and engineering principles applied to well-defined problems defines the grade boundaries.

Criterion 4	Achieved	Merit	Distinction
Quality of submissions (reports) **Engineering Council competence — the learner demonstrates that they:** • **complete and report on challenging tasks successfully within their area of work** • **identify issues that fall outside of their current knowledge and seek advice** • **identify standards and codes of practice relevant to a new task** • **fully understand drawings, permits to work, instructions or other similar documents after appropriate checking, and identifying issues**	The learner maintains their portfolio to an acceptable standard, ensuring that all evidence that meets the grading criteria is recorded. The learner's project activities are in line with the criteria set out in the project briefs and meet the criteria standard. The learner can: • demonstrate good communication skills	The learner maintains their portfolio to a high standard, ensuring that all evidence that meets the grading criteria is recorded. The learner's project activities are in line with the criteria set out in the project briefs and meet the criteria as being of a high standard The learner can: • demonstrate a range of good communication skills	The learner maintains their portfolio to an exceptional standard, ensuring that all evidence that meets the grading criteria is recorded. The learner's project activities are in line with the criteria set out in the project briefs and meet the criteria as being exemplary The learner can: • demonstrate a range of excellent communication skills

Criterion 4	Achieved	Merit	Distinction
Quality of submissions (reports) (continued) **Engineering Council competence — the learner demonstrates that they:** • **complete and report on challenging tasks successfully within their area of work** • **identify issues that fall outside of their current knowledge and seek advice** • **identify standards and codes of practice relevant to a new task** • **fully understand drawings, permits to work, instructions or other similar documents after appropriate checking, and identifying issues**	The learner can: • design **minimum viable solutions** for well-defined technical problems and assist with the design of systems, components or processes to meet business, customer or user needs as appropriate. This involves consideration of applicable health and safety, diversity, inclusion, cultural, societal and environmental matters, codes of practice, and industry standards	The learner can: • design **extended viable solutions** for well-defined technical problems and assist with the design of systems, components or processes to meet business, customer or user needs as appropriate. This involves consideration of applicable health and safety, diversity, inclusion, cultural, societal and environmental matters, codes of practice, and industry standards	The learner can: • design **fully fleshed out viable solutions** for well-defined technical problems and assist with the design of systems, components or processes to meet business, customer or user needs as appropriate. This involves consideration of applicable health and safety, diversity, inclusion, cultural, societal and environmental matters, codes of practice, and industry standards

Guidance

This criterion may be evidenced throughout all course units available for grading. The quality of all submissions for the mandatory and mandatory optional units should be taken into consideration when deciding grade boundaries.

Criterion 5	Achieved	Merit	Distinction
Reflective practice **Engineering Council competence — the learner demonstrates that they:** • **understand and comply with relevant codes of conduct** • **understand the safety implications of their role and apply safe systems of work** • **understand the principles of sustainable development and apply them in their work** • **carry out and record the Continuing Professional Development (CPD) necessary to maintain and enhance competence in their own area of practice** • **understand the ethical issues that may arise in their role and carry out their responsibilities in an ethical manner**	The learner demonstrates examples of reflective practice. The learner engages with the process of meta-skills development in the context of the qualification by: • undertaking self-assessment of meta-skills, giving reasons for ratings or judgements made • setting clear and measurable goals plus action strategies to develop meta-skills in all three categories	The learner demonstrates a broad range of reflective practice. The learner demonstrates a clear commitment to the process of meta-skills development in the context of the qualification by: • undertaking self-assessment of meta-skills, giving some insightful reasons for ratings or judgements made • setting clear and measurable goals plus action strategies to develop meta-skills in all three categories	The learner demonstrates extensive examples of reflective practice. The learner demonstrates strong commitment to the process of meta-skills development in the context of the qualification by: • undertaking self-assessment of meta-skills, giving some insightful reasons for ratings or judgements made • setting clear and measurable goals plus action strategies to develop meta-skills in all three categories, and updating these as required

Criterion 5	Achieved	Merit	Distinction
Reflective practice (cont) **Engineering Council competence — the learner demonstrates that they:** • **understand and comply with relevant codes of conduct** • **understand the safety implications of their role and apply safe systems of work** • **understand the principles of sustainable development and apply them in their work** • **carry out and record the Continuing Professional Development (CPD) necessary to maintain and enhance competence in their own area of practice** • **understand the ethical issues that may arise in their role and carry out their responsibilities in an ethical manner**	The learner engages with the process of meta-skills development in the context of the qualification by: • using reflective practice strategies to track progress and analyse the links between course activities, experiences and meta-skills development The learner can: • evaluate **a minimum range** of environmental and societal impact of solutions to well-defined problems • apply **a minimum range of ethical principles** and recognise the need for engineers to exercise their responsibilities in an ethical manner and in line with professional codes of conduct	The learner demonstrates a clear commitment to the process of meta-skills development in the context of the qualification by: • 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 The learner can: • evaluate **an extended range** of environmental and societal impact of solutions to well-defined problems • apply **an extended range of ethical principles** and recognise the need for engineers to exercise their responsibilities in an ethical manner and in line with professional codes of conduct	The learner demonstrates strong commitment to the process of meta-skills development in the context of the qualification by: • 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 The learner can: • evaluate **a wide range** of environmental and societal impact of solutions to well-defined problems • apply **a wide range of ethical principles** and recognise the need for engineers to exercise their responsibilities in an ethical manner and in line with professional codes of conduct

Guidance

Practitioners must make this judgement alongside the separate meta-skills assessment guidance.

This guidance gives in detail the expectations of the learner's engagement with meta-skills, and how they are expected to go about this in the context of their qualification.

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

Although there is a meta-skills outcome 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.

Criterion 6	Achieved	Merit	Distinction
Plan and manage own work effectively and efficiently — time management **Engineering Council competence — the learner demonstrates that they:** • **identify, organise and use resources effectively to complete tasks, with consideration for cost, quality, safety, security and environmental impact**	The learner demonstrates the ability to meet set or agreed deadlines. The learner can: apply a **satisfactory** systematic approach, as given in the unit specifications, to the solution of well-defined problems	The learner demonstrates the ability to effectively manage workload to agreed deadlines. The learner can: • apply a **well-developed substantiated** systematic approach to the solution of well-defined problems	The learner demonstrates the ability to confidently manage workload and consistently meet deadlines. The learner can: • apply a **significant substantiated** systematic approach to the solution of well-defined problems

Guidance

This criterion may be evidenced predominately by the mandatory Professional Practice in Engineering unit, supported by the opportunities in the mandatory optional units.

The planning and delivery of deadlines for the mandatory and mandatory optional units should be taken into consideration when deciding grade boundaries.

Criterion 7	Achieved	Merit	Distinction
The ability to work with others constructively, to explain ideas and proposals clearly, and to discuss issues objectively and constructively **Engineering Council competence — the learner demonstrates that they:** • **communicate effectively with others, at all levels, in English** • **work effectively with colleagues, clients, suppliers or the public** • **demonstrate personal and social skills and awareness of diversity and inclusion issues**	The learner can work well in a team and demonstrate some team leadership attributes. The learner can: • **recognise** the importance of equality, diversity and inclusion in the workplace • communicate **well** with technical and non-technical audiences	The learner can work effectively in a team and demonstrate some effective team leadership attributes. The learner can: • **recognise and practise** the importance of equality, diversity and inclusion in the workplace • communicate **effectively** with technical and non-technical audiences	The learner can work very effectively in a team and demonstrate the ability to confidently take the lead. The learner can: • **recognise, practise and show leadership on** the importance of equality, diversity and inclusion in the workplace • communicate **effectively, showing leadership** with technical and non-technical audiences

Guidance

This criterion may be evidenced predominately by the mandatory Professional Practice in Engineering unit, supported by the mandatory optional units.

Learners will have extensive opportunities to communicate throughout various units. The most likely source of evidence will be the mandatory Professional Practice in Engineering unit (outcome 4), supported by evidence from the mandatory optional units delivered. The range and application of communication skills defines the grade boundaries.

Additional grading guidance

Engineering Council areas of learning and associated key competences

As the framework expands, there may be opportunities to include more Engineering Council key competences in the grading matrix. These are here for reference.

Area of learning	Skills
Science, mathematics and engineering principles	H1. Apply knowledge of mathematics, statistics, natural science and engineering principles to well-defined problems. This may be evidenced by the Engineering Mathematics 1 and Engineering Principles units, as well as the mandatory optional units. The range and depth of knowledge of mathematics, statistics, natural science and engineering principles applied to well-defined problems define the grade boundaries: **Achieved:** The **minimum range** of knowledge as given in the unit specifications. **Merit:** An **extended range** of knowledge applied or depth of treatment. **Distinction:** A **wide range** of knowledge applied throughout the course.

Area of learning	Skills
Engineering analysis	H2. Analyse well-defined problems reaching substantiated conclusions. This may be evidenced by the mandatory Professional Practice in Engineering unit as well as the mandatory optional units. The largest well-defined problem is the tasks carried out in the mandatory Professional Practice in Engineering unit, but these will likely be enhanced by tasks in the mandatory optional units. The range and depth of analysis leading to substantiated conclusions to well-defined problems will define the grade boundaries: **Achieved:** Analyse well-defined problems reaching **satisfactory conclusions** meeting the minimum criteria given in the unit specifications. **Merit:** Analyse well-defined problems reaching **satisfactory and substantiated conclusions**. **Distinction:** Analyse well-defined problems reaching **significant substantiated conclusions.**

Area of learning	Skills
Engineering analysis (continued)	H3. Use appropriate computational and analytical techniques to solve well-defined problems, recognising the limitations of the techniques employed. This may be evidenced by the restricted core technology units and/or other units that employ computational and analytical techniques. The range and depth of applied computational and analytical techniques to the solution of well-defined problems define the grade boundaries: **Achieved:** Use **appropriate** computational and analytical techniques, as given in the unit specifications, to solve well-defined problems, recognising the limitations of the techniques employed. **Merit:** Use an **extended range** or application of appropriate computational and analytical techniques to solve well-defined problems, recognising the limitations of the techniques employed. **Distinction:** Use a **wide range** or application of appropriate computational and analytical techniques to solve well-defined problems, recognising the limitations of the techniques employed.

Area of learning	Skills
Engineering analysis (continued)	H4. Select and use technical literature and other sources of information to address well-defined problems. This may be evidenced by the mandatory Professional Practice in Engineering unit as well as the mandatory optional units. Some unit specifications will define a range of sources of information while other unit specifications may not. The amount, accuracy and use of these information sources will define the grade boundaries: **Achieved:** Select and use a **limited range** of technical literature and other sources of information, as given in the unit specifications, to address well-defined problems. **Merit:** Select and use an **extended range** of technical literature and other sources of information to address well-defined problems. **Distinction:** Select and use a **wide range** of technical literature and other sources of information to address well-defined problems.

Area of learning	Skills
Design	H5. Design solutions for well-defined technical problems and assist with the design of systems, components or processes to meet business, customer or user needs as appropriate. This involves consideration of applicable health and safety, diversity, inclusion, cultural, societal and environmental matters, codes of practice, and industry standards. This may be evidenced predominately by the mandatory Professional Practice in Engineering unit, supported by the mandatory optional units. The main source of evidence here will be the Professional Practice in Engineering unit. There may be sub-elements for this fed by the work carried out in the mandatory optional units. Many factors define the grade boundaries as given below: **Achieved:** Design **minimum viable solutions** for well-defined technical problems and assist with the design of systems, components or processes to meet business, customer or user needs as appropriate. This involves consideration of applicable health and safety, diversity, inclusion, cultural, societal and environmental matters, codes of practice, and industry standards as given in the unit specifications.

Area of learning	Skills
Design (continued)	**Merit:** Design **extended viable solutions** for well-defined technical problems and assist with the design of systems, components or processes to meet business, customer or user needs as appropriate. This will involve consideration of applicable health and safety, diversity, inclusion, cultural, societal and environmental matters, codes of practice, and industry standards. **Distinction:** Design **fully fleshed out, viable solutions** for well-defined technical problems and assist with the design of systems, components or processes to meet business, customer or user needs as appropriate. This will involve consideration of applicable health and safety, diversity, inclusion, cultural, societal and environmental matters, codes of practice, and industry standards.

Area of learning	Skills
Integrated/systems approach	H6. Apply a systematic approach to the solution of well-defined problems. This may be evidenced predominately by the mandatory Professional Practice in Engineering unit, supported by the mandatory optional units. This competence will most likely be linked to H5. The main source of evidence here will also be the Professional Practice in Engineering unit. There may be sub-elements for this fed by the work carried out in the mandatory optional units. The main difference is that H5 focus is on the outcome of the design process, whereas H6 focus is on the process itself. It may be that the correct process was followed but the outcome is flawed due to inaccurate data. The actual process used will define the grade boundaries as given below: **Achieved:** Apply a **satisfactory** systematic approach, as given in the unit specifications, to the solution of well-defined problems. **Merit:** Apply a **well-developed substantiated** systematic approach to the solution of well-defined problems. **Distinction:** Apply a **significant substantiated** systematic approach to the solution of well-defined problems.

Area of learning	Skills
Sustainability	H7. Evaluate the environmental and societal impact of solutions to well-defined problems. This may be evidenced predominately by the mandatory Professional Practice in Engineering unit, supported by the mandatory optional units. The Professional Practice in Engineering unit requires evidence of environmental and societal impact of solutions to well-defined projects. This evidence may be supported by tasks carried out in the mandatory optional units. The range, accuracy and final evaluation of relevant factors define the grade boundaries: **Achieved:** Evaluate a **minimum** range of environmental and societal impact of solutions to well-defined problems. **Merit:** Evaluate **an extended range of** environmental and societal impact of solutions to well-defined problems. **Distinction:** Evaluate a **wide range of** environmental and societal impact of solutions to well-defined problems.

Area of learning	Skills
Ethics	H8. Apply ethical principles and recognise the need for engineers to exercise their responsibilities in an ethical way, and in line with professional codes of conduct. This may be evidenced predominately by the mandatory Professional Practice in Engineering, unit supported by the mandatory optional units. The professional practice unit requires evidence of applying ethical principles to solutions of well-defined projects. This evidence may be supported by tasks carried out in the mandatory optional units. The range and application of relevant factors define the grade boundaries: **Achieved:** Apply **a minimum range of ethical principles** and recognise the need for engineers to exercise their responsibilities in an ethical way and in line with professional codes of conduct. **Merit:** Apply **an extended range of ethical principles** and recognise the need for engineers to exercise their responsibilities in an ethical way and in line with professional codes of conduct. **Distinction:** Apply **a wide range of ethical principles** and recognise the need for engineers to exercise their responsibilities in an ethical way and in line with professional codes of conduct.

Area of learning	Skills
Risk	H9. Identify, evaluate and mitigate risks (the effects of uncertainty) associated with a well-defined project or activity. This may be evidenced predominately by the mandatory Professional Practice in Engineering unit, supported by the mandatory optional units. The Professional Practice in Engineering unit requires evidence of risk identification to solutions of well-defined projects. This evidence may be supported by tasks carried out in the mandatory optional units. The range and application of relevant factors define the grade boundaries: **Achieved:** Identify, evaluate and mitigate **a minimum range of** risks (the effects of uncertainty) associated with a well-defined project or activity. **Merit:** Identify, evaluate and mitigate **an extended range of** risks (the effects of uncertainty) associated with a well-defined project or activity. **Distinction:** Identify, evaluate and mitigate **a wide range of** risks (the effects of uncertainty) associated with a well-defined project or activity.

Area of learning	Skills
Security	H10. Adopt a holistic and proportionate approach to the mitigation of security risks. This may be evidenced predominately by the mandatory Professional Practice in Engineering unit, supported by the mandatory optional units. The Professional Practice in Engineering unit requires evidence of risk management to solutions of well-defined projects. This evidence may be supported by tasks carried out in the mandatory optional units. The range and application of relevant factors will define the grade boundaries: **Achieved:** Adopt a holistic and proportionate **satisfactory** approach to the mitigation of security risks. **Merit:** Adopt a holistic and proportionate **extended** approach to the mitigation of security risks. **Distinction:** Adopt a holistic and proportionate **wide-ranging** approach to the mitigation of security risks.

Area of learning	Skills
Equality, diversity and inclusion	H11. Recognise the importance of equality, diversity and inclusion in the workplace. This may be evidenced predominately by the mandatory Professional Practice in Engineering unit, supported by the mandatory optional units. The Professional Practice in Engineering unit requires evidence of team working as well as recognition of equality and diversity in the workplace. This may also be evidenced in some mandatory optional units This evidence may be supported by tasks carried out in the mandatory optional units. The range and application of relevant factors define the grade boundaries: **Achieved: Recognise** the importance of equality, diversity and inclusion in the workplace. **Merit: Recognise and practise** the importance of equality, diversity and inclusion in the workplace. **Distinction: Recognise, practise and show leadership** on the importance of equality, diversity and inclusion in the workplace.

Area of learning	Skills
Practical and workshop skills	H12. Use practical laboratory and workshop skills to investigate well-defined problems. This may be evidenced by the mandatory optional units as well as the mandatory Professional Practice in Engineering unit. Throughout the course learners develop a range of practical laboratory and workshop skills. This will mainly be evidenced in relevant mandatory optional units, but may also form part of the tasks in the Professional Practice in Engineering unit. The range and application of relevant skills define the grade boundaries: **Achieved:** Use **a minimum range of** practical laboratory and workshop skills to investigate well-defined problems within the scope of the relevant course units. **Merit:** Use **an extended range of** practical laboratory and workshop skills to investigate well-defined problems within the scope of the relevant course units. **Distinction:** Use **a wide range of** practical laboratory and workshop skills to investigate well-defined problems within the scope of the relevant course units.

Area of learning	Skills
Materials, equipment, technologies and processes	H13. Select and apply appropriate materials, equipment, engineering technologies and processes to plan and undertake well-defined programmes of work. This may be evidenced by the mandatory optional units as well as the mandatory Professional Practice in Engineering unit. Throughout the course learners need to apply appropriate materials, equipment, engineering technologies and processes as defined in the unit specifications. This will mainly be evidenced in relevant mandatory optional units, but may also form part of the tasks in the Professional Practice in Engineering unit. The range and application of relevant skills and techniques define the grade boundaries: **Achieved:** Select and apply **appropriate** materials, equipment, engineering technologies and processes, **to a minimum standard**, as given in the relevant unit specifications, to plan and undertake well-defined programmes of work. **Merit:** Select and apply **an extended range** of materials, equipment, engineering technologies and processes, **to an enhanced standard**, to plan and undertake well-defined programmes of work. **Distinction:** Select and apply **a wide range** of materials, equipment, engineering technologies and processes, **to an exemplary standard** to plan and undertake well-defined programmes of work.

Area of learning	Skills
Quality management	H14. Recognise the need for quality management systems and continuous improvement in the context of well-defined problems. This may be evidenced predominately by the mandatory Professional Practice in Engineering unit, supported by the mandatory optional units. Learners may have limited exposure to quality management systems depending on the mandatory optional units delivered. However, outcome 3 of the Professional Practice in Engineering unit gives learners skills in project management and can be used to introduce learners to the concepts of quality management. The range and application of relevant skills and techniques as applied to quality management define the grade boundaries: **Achieved:** Recognise the need for quality management systems and continuous improvement in the context of well-defined problems to meet the **minimum** requirements of relevant course units. **Merit:** Recognise the need for quality management systems and continuous improvement in the context of well-defined problems to **meet and implement** requirements of relevant course units. **Distinction:** Recognise the need for quality management systems and continuous improvement in the context of well-defined problems to **meet, implement and track** the minimum requirements of relevant course units.

Area of learning	Skills
Engineering and project management	H15. Apply knowledge of engineering management principles, commercial context and project management to well-defined problems. This may be evidenced predominately by the mandatory Professional Practice in Engineering unit, supported by the mandatory optional units. Learners may have limited exposure to project management systems depending on the mandatory optional units delivered. However, outcome 3 of the Professional Practice in Engineering unit gives learners skills in project management. The range and application of relevant skills and techniques as applied to project management define the grade boundaries: **Achieved:** Apply **minimal** knowledge of engineering management principles, commercial context and project management to well-defined problems as defined in relevant unit specifications. **Merit:** Apply **an extended range of** knowledge of engineering management principles, commercial context and project management to well-defined problems as defined in relevant unit specifications. **Distinction:** Apply **a wide-ranging** knowledge of engineering management principles, commercial context and project management to well-defined problems as defined in relevant unit specifications.

Area of learning	Skills
Teamwork	H16. Function effectively as an individual and as a member of a team. This may be evidenced predominately by the mandatory Professional Practice in Engineering unit, supported by the mandatory optional units. Learners have varying degrees of exposure to team working throughout various units. The most likely source of evidence is the Professional Practice in Engineering unit, supported by evidence from the mandatory optional units delivered. The range and application of team working skills define the grade boundaries: **Achieved:** Function **well** as an individual and as a member of a team. **Merit:** Function **effectively** as an individual and as a member of a team. **Distinction:** Function **effectively showing leadership** as an individual and as a member of a team.

Area of learning	Skills
Communication	H17. Communicate effectively with technical and non-technical audiences This may be evidenced predominately by the mandatory Professional Practice in Engineering unit, supported by the mandatory optional units. Learners have extensive exposure to communication throughout various units. The most likely source of evidence is the Professional Practice in Engineering unit (outcome 4), supported by evidence from the mandatory optional units delivered. The range and application of communication skills define the grade boundaries: **Achieved:** Communicate **well** with technical and non-technical audiences. **Merit:** Communicate **effectively** with technical and non-technical audiences. **Distinction:** Communicate **effectively showing leadership** with technical and non-technical audiences.

Area of learning	Skills
Lifelong learning	H18. Plan and record self-learning and improve performance, as the foundation for lifelong learning/CPD. This may be evidenced predominately by the mandatory Professional Practice in Engineering unit, supported by the opportunities in the mandatory optional units. The evidence for this will come from outcome 5 of the Professional Practice in Engineering unit, supported by additional work in the mandatory optional units. Each learner will have different meta-skills profiles, but the range and application of communication skills define the grade boundaries: **Achieved:** Plan and record self-learning and improve performance, as the foundation for lifelong/learning/CPD to the **minimum** requirements of the unit specification **Merit:** Plan and record self-learning and improve performance, as the foundation for lifelong/learning/CPD **detailing distance travelled throughout the course**. **Distinction:** Plan and record self-learning and improve performance, as the foundation for lifelong/learning/CPD demonstrating **effectively detailing distance travelled throughout the course**.

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.