



T Level Technical Qualification in Science

Occupational specialism assessment (OSA)

Food Sciences

All assignments

Provider guide

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All assignments

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Introduction

This occupational specialism is assessed by a synoptic assessment consisting of a package of 4 assignments. The assignments require the student to independently apply an appropriate selection of knowledge, understanding, skills and techniques developed throughout the full course of study in response to briefs or tasks, or as part of their industry placement. This will allow the student to demonstrate that they have met a level of threshold competence in the performance outcomes of the occupational specialism.

The synoptic assessment for this occupational specialism is graded pass, merit or distinction, and the final grade will contribute 50% of the overall technical qualification grade, so it is important that students have the opportunity to produce work of the highest standard they can. The assignments within this synoptic assessment are designed to allow the student to do this in a way that is as occupationally realistic as possible.

What is threshold competence?

Threshold competence is defined as a level of competence that:

- signifies that a student is well-placed to develop full occupational competence, with further support and development, once in employment
- is as close to full occupational competence as can be reasonably expected of a student studying the technical qualification in a provider-based setting with a substantial industry placement
- signifies that a student has achieved the level for a pass in relation to the relevant occupational specialism component

This level is reflected in the grading descriptors of the occupational specialism and successful completion of the assignments will ensure that students are well-placed to develop full occupational competence once in employment. Grading descriptors can be found in the technical qualification specification document.

What is synoptic assessment?

Synoptic assessment is a form of assessment in which students are required to demonstrate that they can identify and use in an integrated way an appropriate selection of skills, techniques, concepts, theories and knowledge from across the technical area, relevant to the tasks.

Synoptic assessment is integral to high-quality technical qualifications to allow students to demonstrate a holistic understanding of the sector, making effective connections between different aspects of the subject content.

The assignments and tasks in this assessment are designed to be synoptic in a way that is as occupationally realistic as possible.

How will students be assessed?

Students will be assessed against the following set of performance outcomes (POs) that describe what the student should be able to do:

Food Sciences POs	
PO1	Perform appropriate activities to support the food supply chain, complying with regulatory requirements
PO2	Develop new food and food related products to support the food supply chain
PO3	Identify and resolve issues in the food supply chain
PO4	Collect, analyse and interpret food production data

The synoptic assessment consists of 4 assignments:

- a detailed planning proposal for a new or existing product to meet a specified current consumer trend
- the undertaking of practical tasks related to the development of a new or existing product brief
- completion of a risk assessment from a given scenario, analysing complaints and taking appropriate actions to resolve trends, root cause/s and recommendations for preventative actions
- analysis of customer requirements, food safety, productivity and quality data, whilst identifying solutions to reduce errors and opportunities for continuous improvement

Assignments are broken down into tasks where necessary. The assignments, tasks and associated guidance for students and tutors show how the assignments are expected to be delivered.

Evidence produced by students for the assignments will be sent to NCFE for marking. Assessment judgements, including overall judgement of the performance required at each of the grade boundaries, will be made by NCFE and results released to the provider at the appropriate time.

Assignment coverage

See the table at the end of this provider guide which shows how the PO content is covered by the assignments and tasks.

Controls

There is a requirement for work completed under supervised conditions to be collected and securely stored; that controls are in place to ensure that providers do not release materials to their students until the appropriate time, that when they do release materials they are retrieved as appropriate; that tasks are designed in ways that minimise any advantage students might gain by having prior knowledge of what they entail.

Where the occupational specialism assessments allow for research requiring the use of the internet, students must reference the sources in their work.

Marks

Marks available for each assignment are detailed below.

Assignment	Raw marks	% weighting
1 Perform appropriate activities to support the food supply chain, complying with regulatory requirements	115 marks	37.1%
2 Develop new food and food related products to support the food supply chain	112 marks	36.1%
3 Identify and resolve issues in the food supply chain	41 marks	13.2%
4 Collect, analyse and interpret food production data	42 marks	13.6%
Total	310 marks	100%

Assessment timings

Assignment 1 consists of a series of planning activities which will take place within the provider setting. The time allocation for this assignment is 7 hours 30 minutes in total, divided as:

- task 1 – 2 hours 10 minutes
- task 2 – 2 hours 55 minutes
- task 3 – 1 hour 15 minutes
- task 4 – 1 hour 10 minutes

A submission deadline for the evidence for assignment 2 will be set for each academic year to allow NCFE to carry out moderation and awarding before the release of results in August of that year. The time allocation for this assignment is 7 hours 30 minutes in total. Some tasks will not require the full allocated time; the guidance is a maximum to account for potential choices by students to complete the tasks (for example, cooking time, number of people in taste panel). Some tasks are partially completed alongside other tasks, though time is still accounted for them in total. Overall, no more time than the allocated 7 hours 30 minutes can be taken, and NCFE recommends not using more than the guidance per task:

- task 1, 2 & 3 – 2 hours 45 minutes
- task 4, 5 & 6 – 2 hours 15 minutes
- task 7, 8, 9 & 10 – 2 hours 30 minutes

Assignments 3 and 4 will be sat on a date and time set by NCFE. All students must sit the assignment on this date at the same time.

The time allocation for assignment 3 is 3 hours 30 minutes, divided as:

- task 1 – 1 hour 45 minutes
- task 2 – 1 hour 45 minutes

The time allocation for assignment 4 is 4 hours 30 minutes, divided as:

- task 1 – 2 hours 30 minutes
- task 2 – 2 hours

Assignment specific guidance

Assignment 1: perform appropriate activities to support the food supply chain, complying with regulatory requirements

Preliminary material

The preliminary material will be sent to providers ahead of the assessment window. Providers must issue the preliminary material to their students no more than 1 week prior to the scheduled assessment.

Students will use this time to carry out research related to the contents of the preliminary material.

Students are not allowed to bring their research or any other unauthorised materials into the supervised environment.

Planning task

The planning task is completed in supervised conditions over a period of 7 hours 30 minutes during an NCFE specified assessment window.

Providers must ensure that their entire cohort of students complete this assignment in the same scheduled sessions.

Written assignments should be completed under exam conditions following JCQ regulations.

Providers may schedule supervised rest breaks during the assessment. Any rest breaks must be supervised, and students must not have access to any resources during this time. In addition, assessment materials must be kept securely and must not be removed from the supervised environment.

Students may have access to the internet but may not bring anything into the supervised environment. Students may request access to in-house systems/intranet to find out costings for ingredients, packaging and such that may be required for task 2.2. Providers may allow such access but must ensure that students do not use the internet to carry out research to help them with other elements of assignment 1. Providers must receive declarations from all students to ensure honesty and authenticity.

Students are required to sign declarations of authenticity to confirm that all the work they complete during the supervised assessment is their own. Students must be made aware of the importance of this declaration and the impact this could have on their overall grade, if malpractice was to be identified. Providers must also ensure that students' work is authenticated by the tutor before it is submitted to NCFE for marking. The declaration forms are available on the NCFE website.

The assignment is a formal external assessment and must be conducted with reference to the instructions on the front of the assignment booklet, as well as the QSID, which should be accessed from www.qualhub.co.uk to ensure they are the most up-to-date versions.

Providers are not allowed to give any support or guidance to students during the supervised time.

Students must ensure that all materials can be identified as their own work.

Assignment 2: develop new food and food related products to support the food supply chain (undertaking practical tasks related to the NPD/EPD brief)

As per instructions from the assignment brief, also mentioned in assessment 1, the students will have given their provider a list of equipment and ingredients/materials required for cooking and creating packaging. The provider will have this available to students in time for this assessment. Students can use their own equipment if preferred (for example, utensils, apron) as this will not give a student an advantage over another. Electrical equipment may need to be checked as per provider health and safety rules (for example, portable appliance testing (PAT)).

This assignment consists of multiple stages within the development of a new or existing food product. This ranges from carrying out health and safety risk assessment through to production of product samples and methods to review and evaluate the processes leading to the product's completion. A final assessment of the product's formulation and processing completes the requirements of this assignment.

This is a practical task which requires access to kitchens, equipment and utensils required to produce the samples and record the results following analysis. Adequate workspace needs to be provided with space between students. However, there may be equipment used which requires students to be momentarily closer, for example, taking something out of the oven. There would not be any benefit to a student being able to see the work of another student. However, exam conditions should still be observed, for example, turn over paper when leaving workstation, no talking.

Part of the assignment requires students to carry out a taste panel for the product, requiring a minimum of 8 participants. Participants can be internal or external to the organisation. These need to be arranged in advance by the provider (with input from students) and should be the same 8 (or more) for all students.

This assessment can be split into 3 sessions of 2 hours and 30 minutes, allowing for the variables of preparation and cooking time; some students will require more/less time than others for preparation and cooking and should not be concerned about this affecting their overall marks. To support reliability of demand, you may guide or support students to amend their choices for product development so that the preparation and cooking time required is not significantly higher than other students, nor too long that it is unrealistic to complete within the permitted time including regular breaks.

Providers must ensure that their entire cohort of students complete this assignment in the same scheduled sessions.

Assignment 3: identify and resolve issues in the food supply chain

Assignment 3 is to be completed under supervised conditions over a period of 3 hours 30 minutes.

Both tasks in this assignment must be completed under supervised conditions.

Written assignments should be completed under exam conditions following JCQ regulations.

Task 1

Students will be provided with a scenario where they will complete a risk assessment based on the brief and the raw data supplied. Within their risk assessment, students will be required to justify their conclusions and supply any additional information that may improve the risk rating.

Task 2

Students are provided with complaint data which they are required to analyse. Students are then required to identify any trends and the main reasons for complaints. To complete the assignment, students will conduct root cause analysis, prioritise actions to resolve issues and recommend appropriate preventative actions.

Providers may schedule supervised rest breaks during the assessment. Any rest breaks must be supervised and students must not have access to any resources during this time. In addition, assessment materials must be kept securely and must not be removed from the supervised environment.

Students may not have access to the internet and may not bring anything into the invigilated environment.

The assignment is a formal external assessment and must be conducted with reference to the instructions on the front of the assignment booklet, as well as the qualification specific instructions for delivery (QSID), which should be accessed from www.qualhub.co.uk to ensure they are the most up-to-date versions.

Students must ensure that all materials can be identified as their own work.

Assignment 4: collect, analyse and interpret food production data

Assignment 4 is to be completed under supervised conditions over a period of 4 hours 30 minutes.

Both tasks in this assignment must be completed under supervised conditions.

Written assignments should be completed under exam conditions following JCQ regulations.

Students will be provided with a scenario where they will analyse the brief and the raw data supplied. This will be presented in a spreadsheet format. Students will require access to spreadsheet or similar appropriate software to analyse and present the data. Students are required to produce a report based on their analysis. Using their analysis, students must identify solutions to errors as well as the identification of opportunities for continuous improvement.

Students may not have access to the internet and may not bring anything into the invigilated environment.

Providers may schedule supervised rest breaks during the assessment. Any rest breaks must be supervised and students must not have access to any resources during this time. In addition, assessment materials must be kept securely and must not be removed from the supervised environment.

The assignment is a formal external assessment and must be conducted with reference to the instructions on the front of the assignment booklet, as well as the regulations for the conduct of external assessment and qualification specific instructions for delivery (QSID) documents, which should be accessed from www.qualhub.co.uk to ensure they are the most up-to-date versions.

Students must ensure that all materials can be identified as their own work.

Assignment coverage

Assignment 1: perform appropriate activities to support the food supply chain, complying with regulatory requirements

Skills and knowledge mapping

Skills

S1.72: Identify the appropriate food safety and health and safety procedures that need to be in place to support food safety and regulatory compliance, within a specific area of the food supply chain (for example, growers/suppliers, transportation, production, distribution, retail)

S1.73: Identify the labelling requirements of food and drinks products to comply with the required legislation and regulations:

- nutritional information
- quantitative ingredient declaration (QUID)
- calorific values
- all ingredients – allergens are emphasised, for example, emboldened
- origin of raw materials
- use by and best before dates
- weights and measures

S1.79: Contribute to a hazard analysis critical control point (HACCP) plan for a simple product, following the 12 steps, by creating a HACCP flow diagram as outlined in step 4 of the 12 HACCP steps

S1.84: Review a specific food safety and quality management procedure to ensure that the food quality or food safety standard will be met (for example, cooking temperature, overall product quality, storage requirements, allergen controls, product nutritional value)

S1.89: Select raw materials as per recipe/client requirement, to ensure that the finished product:

- meets recipe requirements
- provides the required nutritional value and organoleptic requirements
- meets product specification (for example, preservatives, colour, binding agent, emulsifier, origin of raw materials)

S1.92: Check all customer requirements have been met in order to ensure quality of product and shelf life of food

S1.93: Verify existing procedures are meeting food safety and quality standards:

- heat processing techniques:
 - checking core temperature in food is being achieved
- heat removal:
 - checking product is cooled/chilled/frozen within specified timeframe and to right temperature
- customer specifications:
 - checking finished product against specification
 - comparing the colour of finished product to photographic specification evidence

- packaging and labelling meet the required safety and quality standards:
 - checking the correct packaging and labelling have been used

S2.26: Perform an impact assessment of consumer trends on the design of both a new product development and an existing product development

S2.27: Formulate a recipe from first principles, taking into consideration the customer requirements

S2.30: Recommend packaging when developing a new food product, considering innovations in packaging to reduce plastic waste and increase opportunities for recycling

S2.31: Carry out a product costing on a new product and on a modification to an existing product

S2.36: Select a suitable test method, depending on the purpose of the test:

- compliance
- product quality
- product safety

S2.37: Analyse test results to confirm nutritional requirements and ensure product safety

Knowledge

K1.16: How to implement and maintain a hazard analysis and critical control points (HACCP)-based food safety management system

K1.25: The purpose of monitoring food safety management systems

K1.26: The purpose of a range of checks that are carried out to verify food safety

K1.41: The functionality of raw materials including:

- to meet specific product requirements (for example, preservatives, colour, binding agent, emulsifier)

K1.43: What to consider when selecting raw materials for a particular product, including:

- food safety requirements (for example, allergens)

K1.51: The intrinsic and extrinsic factors used to determine the shelf life of food

K1.53: How a range of food additives (including preservatives) and ingredients with food additive properties can extend the shelf life of food

K1.56: How heat processing techniques may change food and drinks, including:

- microbial growth, spore formation and survival which impacts on shelf life of food

K1.58: Why heat-removal-based food technology is used within the food and drinks industry

K1.60: Why ambient temperature processing is used within the food and drinks industry, including:

- to control pH levels and water activity
- to prevent the growth and multiplication of microorganisms

K1.61: The advantages, limitations and uses of the following different types of packaging used in the food and drinks industry

K1.63: How to implement and maintain a HACCP-based food safety management system, by following the detailed requirements of the following 12 steps

K2.1: The stages and principles of the product development process, from concept to launch

K2.2: Why an existing product may need to be changed

K2.6: The first principles of recipe balance:

- proportionality
- nutrient balance
- organoleptic properties
- ingredient substitution where appropriate

K2.9: The reasons for selecting ingredients for specific applications

K2.11: A range of packaging innovations used to reduce plastic waste/increase opportunities for recycling

K2.13: How to calculate total production run costs:

- raw material cost (recipe ingredients and packaging × number of products)
- labour cost (number of people × hourly rate × number of hours)
- utility costs (hourly rate × number of hours)
- equipment (hourly rate × number of hours)
- distribution and transportation costs (batch size and number of vehicles required)

Assignment 2: develop new food and food-related products to support the food supply chain

Skills and knowledge mapping

Skills

S2.26: Perform an impact assessment of consumer trends on the design of both a new product development and an existing product development

S2.27: Formulate a recipe from first principles

S2.28: Enhance an existing recipe, selecting the correct ingredients based on their functionality to improve the flavour of the product

S2.29: Develop a new food product to meet customer requirements, taking into account:

- the suitability of all raw materials
- substituting raw materials, dependent on consumer need and seasonality

S2.30: Recommend packaging when developing a new food product, considering innovations in packaging, to reduce plastic waste and increase opportunities for recycling

S2.31: Carry out a product costing on a new product and on a modification to an existing product by:

- calculating individual component costs and production run costs to give a total cost

S2.32: Carry out a sustainability analysis on a new product by identifying the social, environmental and economic implications of the:

- raw materials
- packaging
- reuse of waste
- energy usage
- transportation

S2.33: Present information on a sustainability analysis of a new product (for example, using a presentation, written report, graphs, tables)

S2.34: Contribute to continuous improvement to drive down costs and drive up quality by following the Deming cycle

S2.35: Follow procedural requirements to collect samples, including:

- collecting the correct sample size
- collecting the correct numbers per batch
- collecting the sample at the correct frequency

S2.36: Select a suitable test method, depending on the purpose of the test

S2.37: Analyse test results to confirm nutritional requirements and ensure product safety

Knowledge

K2.1: The stages and principles of the product development process from concept to launch

K2.2: Why an existing product may need to be changed

K2.3: How the process for changing an existing product would differ to that of a new product development process

K2.4: Different consumer trends which may drive the design of a new product

K2.5: How impact assessments are used to investigate the viability of a new product

K2.6: The first principles of recipe balance

K2.7: Why ingredients may need to be substituted

K2.8: How the functionality of ingredients can be used to enhance a recipe

K2.9: The reasons for selecting ingredients for specific applications

K2.10: A range of raw material alternatives that can be used when formulating a recipe

K2.11: A range of packaging innovations used to reduce plastic waste/increase opportunities for recycling

K2.12: How individual costs of different components contribute to the overall product costs

K2.13: How to calculate total production run costs

K2.14: The importance of procuring raw materials from sustainable sources (for example, sustainable palm oil)

K2.15: Ways in which to reduce the use of plastic (for example, black plastic), whilst ensuring the packaging remains fit for purpose

K2.16: Ways in which to reuse waste

K2.17: Ways in which to reduce energy usage in developing a new product

K2.18: How to reduce the effect of transportation on the environment

K2.19: How to use workplace organisational techniques for continuous improvement

K2.20: Ways to maximise equipment efficiency

K2.21: The considerations of process limitations (for example, bottlenecks)

K2.22: How to manage the 8 types of waste within a food and drinks manufacturing process

K2.23: The relationship between the drivers for cost and quality and improving value

K2.24: How the sample size, sample numbers per batch and frequency of sampling are determined for the procedural requirements

K2.25: The purpose of different test methods that can be used to test new food products and/or identify and resolve issues in the food supply chain

Assignment 3: identify and resolve issues in the food supply chain

Skills and knowledge mapping

Skills

S3.8: Identify and resolve problems relating to quality issues and/or customer complaints using appropriate problem-solving techniques

S3.9: Apply the 8 stages of root cause analysis to investigate problems and/or customer complaint and recommend suggestions for improvement

S3.10: Carry out procedures for quality control testing and sensory analysis

Knowledge

K3.1: The purpose of using problem-solving techniques (for example, root cause analysis) when investigating and resolving problems within the food and drinks industry

K3.2: The importance of identifying and resolving problems relating to customer complaints and quality issues

K3.3: The principles of sensory evaluation used in food operations

K3.5: How to determine the sampling required as part of the sensory analysis panels

K3.6: How different procedures are used to measure quality control and sensory analysis in food operations

K3.7: The importance of maintaining specifications when carrying out sensory evaluation in food operations

Assignment 4: collect, analyse and interpret food production data

Skills and knowledge mapping

Skills

S4.6: Create a spreadsheet to track production trends

S4.7: Input management data to track production trends, demonstrating digital critical literacy by ensuring confidentiality processes are followed to ensure safety, security and privacy (for example, when using screens to input data)

S4.8: Systematically organise data in order to track production trends

S4.9: Critically interpret the data, considering process and scale, and any out of tolerance results that breach the critical limit

Knowledge

K4.1: Where to collect food production data from in relation to:

- food safety
- food quality
- customer requirements

K4.2: How to interpret and analyse food production data

K4.3: How different applications, including spreadsheets, databases and data loggers, can be used to support the interpretation and analysis of food production data

K4.4: Why an electronic resources planning system (management information system) is used within the food and drinks industry

K4.5: How trends in food production data can be used for continuous improvement within the food and drinks industry

Performance outcome grid

Assignment 1

Task	PO1	PO2	PO3	PO4	Total
1	33	0	0	0	33
2	45	0	0	0	45
3	21	0	0	0	21
4	16	0	0	0	16
Total marks	115	0	0	0	115
% weighting	100%	0%	0%	0%	100%

Assignment 2

Task	PO1	PO2	PO3	PO4	Total
1	0	12	0	0	12
2	0	14	0	0	14
3	0	9	0	0	9
4	0	12	0	0	12
5	0	9	0	0	9
6	0	12	0	0	12
7	0	8	0	0	8
8	0	12	0	0	12
9	0	12	0	0	12
10	0	12	0	0	12
Total marks	0	112	0	0	112
% weighting	0%	100%	0%	0%	100%

Assignment 3

Task	PO1	PO2	PO3	PO4	Total
1	0	0	20	0	20
2	0	0	21	0	21
Total marks	0	0	41	0	41
% weighting	0%	0%	100%	0%	100%

Assignment 4

Task	PO1	PO2	PO3	PO4	Total
1	0	0	0	24	24
2	0	0	0	18	18
Total marks	0	0	0	42	42
% weighting	0%	0%	0%	100%	100%

Document information

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Owner: Head of Assessment Design

Change History Record

Version	Description of change	Approval	Date of Issue
v1.0	Post approval, updated for publication.		January 2021
v1.1	NCFE rebrand.		September 2021
v1.2	OS review Feb 23		February 2023
v1.3	Sample added as a watermark	November 2023	21 November 2023