

Course title

'Higher Technician in food design and production technologies'

Course structure

Matrix of learning outcomes and structure **Year 1**

<i>Learning outcomes of the course</i>	<i>Training units</i>	<i>Learning outcomes of the training unit</i>	<i>Outcome assessment methods and criteria</i>	<i>Learning methods and contexts and the related work loads (hours)</i>	<i>Number of credits ECTS</i>
Managing communication and relational processes within and outside the organization both in Italian and in English	Technical English	At the end of the training unit students will have learnt how to: - communicate correctly and effectively in a work context with foreign contacts - comply with the rules of Business English - use technical English (micro language) related to the relevant technological area - communicate correctly via email - manage telephone conversations - read, understand and interpret the relevant technical documentation in English	Method: Written multiple choice test and oral discussion in English. Criteria: Students shall provide proof of their mastery of the sectoral technical terminology and grammatical and syntactical correctness, as well as their fluency in conversational English.	Classroom: 44 hours Studying from home: 9 hours	2
	Communication techniques	At the end of the training unit students will have learnt how to: - understand the communication process - discern the size of content and of relationship in exchange of letters - further develop techniques for building content following the principle of appropriateness of language (code) - build a positive relationship with the contact person, implementing active listening, empathy and good dialogue practices - recognize the importance of every language act (gesture, word) and the performance effect of communication (impact) - tell the difference between text, context and interpretation, detecting cases of distortion in exchange of communications - activate the main negotiation and conflict management techniques	Method: Oral examination through simulations and role playing Criteria: Students must demonstrate an effective use of communication and/or negotiation techniques and those for managing potentially conflictual situations.	Classroom: 40 hours Studying from home: 20 hours	2.5

Learning outcomes of the course	Training units	Learning outcomes of the training unit	Outcome assessment methods and criteria	Learning methods and contexts and the related work loads (hours)	Number of credits ECTS
Mastering language tools and information and communication technologies for interacting in work environments	Computer and multimedia studies	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - master language tools and information and communication technologies in order to interact in day-to-day life and in a working environment - manage information flows - assess the implications of information flows versus effective and efficient management of production or service processes, finding also alternative solutions to guarantee quality - create and format text documents (letters, reports and articles) - create, format, modify and use spreadsheets, developing standard formulas and functions and creating and formatting graphs and tables - create, format, modify and prepare professional presentations - set up and use instruments for on-line production and collaboration and cloud computing: calendar, blog, wiki, video conferences and e-learning environments - use the web safely: manage a safe web connection, use the Internet without risk and manage data and information adequately 	Method: Practical test on PC Criteria: Students must demonstrate mastery of the use of the main Office Automation applications and familiarity in correctly navigating on the web.	Classroom/workshop: 60 hours Studying from home: 30 hours	3
Use mathematical and statistical instruments and models in describing and simulating the various phenomena of the relevant area	Applied statistics	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - use statistical instruments and models in describing and simulating the various phenomena in the agro-food sector and in applying and developing the appropriate technologies - prepare technical and regulatory documentation - adopt experimental research methods for the technological applications of the relevant areas - use statistics for data collection and quality purposes - understand the sources of variability and statistical process control - adopt statistical methods for risk analysis in the food industry - apply statistical instruments (sheets, diagrams and control charts) and managerial instruments (problems, decisions, activities) - make a distinction between various types of control charts (by variables and by attributes) 	Method: Practical test on PC with analysis of corporate case study. Criteria: Students must demonstrate, based on a given business case study, that they have knowledge of and can use statistics for collecting data for quality purposes.	Classroom/workshop: 28 hours Studying from home: 14 hours	1
Knowing the elements making up the undertaking, the company's impact on the relevant local sector, the rules governing the life of the undertaking and its external relationships at national, European and international level	Agro-food marketing	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - be familiar with the elements making up the undertaking and the company's impact on the relevant region - identify the company's competitive factors and its positioning in the relevant market - recognise the characteristics and dynamics of the agro-food market - understand globalization and the scenarios of ever-changing demand (diet, taste and propensity to consume food products) - analyse the agro-food system and the configuration of its value chain: primary and secondary products, distribution and consumption - apply the strategic marketing approach to the agro-food company: market segmentation, product positioning and marketing mix programme (product policy, pricing policy, sale and distribution policy, communication and promotion policy) 	Method: Written examination with case study: identifying competitive factors of a given food processing company Criteria: Students must demonstrate, based on a given business case study, that they know how to apply the strategic marketing approach to the agro-food company.	Classroom: 26 hours Studying from home: 13 hours	2

Learning outcomes of the course	Training units	Learning outcomes of the training unit	Outcome assessment methods and criteria	Learning methods and contexts and the related work loads (hours)	Number of credits ECTS
	Food legislation I	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - find the sources of law governing the life of the business and its external relationships at national, European and international level - comply with the requirements applied by the legislation in force to the food sector - understand and apply the rules on Labelling, display and advertising of food according to Regulation (EU) No 1169/2011 - apply the provisions on nutritional labelling: nutritional values of the product, maximum acceptable daily consumption - recognise the English voluntary labelling system "Traffic Light" - monitor corporate compliance 	Method: Written multiple choice test. Criteria: Students must demonstrate that they are familiar with the requirements applied to undertakings in the sector by applicable food legislation.	Classroom: 26 hours Studying from home: 13 hours	2
	Health and safety in the workplace	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - recognise the concepts of Risk, Damage, Prevention and Protection - understand the organization of corporate prevention - be aware of the rights, duties and penalties provided for by the legislation for the various corporate entities - activate the supervisory, control and assistance bodies - recognise and discern the main types of specific risk in the agro-food sector - use Personal Protection Equipment correctly - observe safety signs and procedures in the work place 	Method: Written multiple choice test. Criteria: Students must demonstrate that they are familiar with the rules on health and safety in the work place and with the organizational prevention and protection measures	Classroom: 16 hours Studying from home: 9 hours	1
	Company structure	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - recognise the organizational structure, the division of labour (line and staff) and the coordination mechanisms (supervision hierarchy, standardization, mutual adaptation) - distinguish between various organizational models (functional, process, matrix and project based) - interpret the organizational chart and the system of levels, roles, duties and responsibilities - comply with the procedures, flows and systems of work hours - join a community of practice - manage relations and collaborations within the organization in a work context - manage external, interpersonal and institutional relationships and collaborations 	Method: Structured open-ended questionnaire. Criteria: Students must demonstrate their knowledge of the various organizational models, answering open questions in which they are requested to discuss their answers.	Classroom: 12 hours Studying from home: 13 hours	1
Conduct and interpret analysis on agro-food products and processes;	Microbiology and food hygiene	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - recognise food-related micro organisms (bacteria, yeasts, moulds, viruses) distinguishing their main characteristics - determine the microbic growth curve and the effects on the environment - understand the systems for determining micro organisms in food and the related numbering system - recognise pathogenic micro organisms - conduct risk analysis and manage shelf life and challenge tests - recognise sources of microbic contamination of food and the factors conditioning their presence and development - activate the monitoring of microbic development and the sterilization methods - conduct or interpret analysis on agri-food products and processes 	Method: Practical test. Criteria: Students must demonstrate that they are able to perform microbiological analysis on certain agro-food products.	Classroom/workshop: 30 hours Studying from home: 15 hours	2

Learning outcomes of the course	Training units	Learning outcomes of the training unit	Outcome assessment methods and criteria	Learning methods and contexts and the related work loads (hours)	Number of credits ECTS
	Food safety and HACCP	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - master the Codex Alimentarius (CAC RCP-1) and the HACCP method (Hazard Analysis and critical control point) - implement self-control procedures based on HACCP principles - know the prerequisites of food safety - apply good manufacturing practices (GMP) - gain awareness of the aspects of responsibility for operators in the food sector (OSA) - manage non-compliances and non-compliant product issues - apply GMP (Good Manufacturing Practices), SOP (Standard Operating Procedures) and SSOP (Sanitization Standard Operating Procedures) on materials, processes and products for quality improvement purposes 	Method: Written multiple choice test. Criteria: Students must demonstrate that they know the food safety procedures and the HACCP.	Classroom: 40 hours Studying from home: 20 hours	2.5
	Equipment sanitisation	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - use the terms cleaning, disinfection, sterilisation and sanitization correctly - comply with the legislation in force on system requisites for the food industry based on sanitization - assess the adequacy of the system based on cleaning procedures - define the cleaning and sanitization procedures - distinguish the use of water, detergents and disinfectants in the food industry - recognise the physical agents of disinfection: heat (steam, hot water), radiation - define the cleaning and sanitization procedures 	Method: Practical test. Criteria: Standing before a system, students will be asked to define the related cleaning and sanitisation procedures.	Classroom/workshop: 16 hours Studying from home: 9 hours	1
	Preventing infestations and control methods	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - recognise the type of infestations: rodents, cockroaches, flies, ants, food insects, birds and other invertebrates - gain awareness of the public health risk (pathogens transmitted by contaminated food) - gain awareness of the food safety risk (physical contamination of products from excrements, parts or other foreign bodies, introduction of micro organisms, damage to the product or packaging) - gain awareness of the public health and environment risk (from misuse of pesticides) - comply with the food industry infestation management standards - apply adequate factory inspection and control procedures - apply non-chemical monitoring and control instruments (electric fly-paper units, pheromone traps, food traps, adhesive detectors) and chemical control methods (disinfestants) - take preventive action against infestations 	Method: Written multiple choice test. Criteria: Students must demonstrate that they are familiar with the various types of infestations and that they know how to apply the main prevention and control methods.	Classroom: 16 hours Studying from home: 9 hours	1

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Apply control systems to materials, processes and products for quality improvement purposes	Regulatory and voluntary product certifications	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - recognise the main voluntary product certifications - recognise DOP and IGP branded products (Reg EC 510/2006) - distinguish the properties of Traditional Specialities Guaranteed (Reg EC 509/2006) - recognise and distinguish biological products (Reg EC 834/2007) and the common organization of the market in wine (Reg EC 491/2009) - be familiar with the standards and apply the BRC (British Retailer Consortium) and IFS (International Food Standard) voluntary product rules - exploit GLOBALGAP certification opportunities in order to sustain the marketing of fruit and vegetables - exploit NO GMOs certification opportunities for products at risk of GMO 	Method: Written multiple choice and/or open test. Criteria: Students must demonstrate that they have knowledge of voluntary product certifications and of the opportunities and advantages available to undertakings as a result of their implementation.	Classroom: 20 hours Studying from home: 10 hours	1
Be familiar with the production and transformation processes in the agro-food specialisation areas	Primary production	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - identify the value chain and the characteristics of the primary sector - distinguish the main tree and vegetable crops for consumption and industrial use - discern the general botanical and chemical and organoleptic characteristics of grain (corn, rice, minor cereals), beetroot, industrial tomato and fruit - differentiate the cultivation techniques based on intended use (consumption and industrial use) - analyse the biological, physical, chemical and organoleptic properties of productions based on the intended industrial and consumer use - recognise the main livestock (cows, pigs, poultry and rabbits) and fishery techniques 	Method: Written multiple choice and/or open-ended test. Criteria: Students must demonstrate that they are able to identify primary productions and farms.	Classroom: 20 hours Studying from home: 10 hours	1
	Industrial processes and unit operations	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - recognise industrial food transformation processes - manage the following industrial unit operations on raw materials, semi-finished and finished products/feed: <ol style="list-style-type: none"> 1) Washing and removal either by dry or wet process of components and superficial contaminants; 2) Cleaning and removal of non-edible parts (peeling and removal of core material, bones and fishbones); 3) Size reduction (cutting, grinding, lamination, compression); 4) Stabilization (pasteurization, sterilization, quick-freezing, drying, lyophilisation); 5) Mixing (dissolution, kneading, homogenization); 6) Transformation (fermentation, chemical reactions, cooking); 7) Separation (screening, filtering, squeezing, centrifugation, crystallization, distillation) 	Method: Practical test. Criteria: Standing before a system, students must be able to carry out certain unit operations on the raw materials provided.	Classroom/workshop: 34 hours Studying from home: 17 hours	2

Learning outcomes of the course	Training units	Learning outcomes of the training unit	Outcome assessment methods and criteria	Learning methods and contexts and the related work loads (hours)	Number of credits ECTS
	Plant technologies in the food industry	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - recognise the types of machinery used and the related technological standards in the main indivisible industrial processes - distinguish machinery and equipment for product handling and for primary and secondary packagings (conveyor belts, lifts, hoists, sorters, palletizers, basket loaders, etc.) - use automatic process control technologies and AIDC technologies (Automatic Identification and Data Capture) for internal traceability purposes and to reduce food waste - use non-packaged product cooling equipment and technologies - use technologies for treating and reducing thermal damage; - manage system maintenance policies in an optimal way 	Method: Written multiple choice test. Criteria: Students must demonstrate that they are able to identify and distinguish the plant technologies of the food industry.	Classroom/workshop: 34 hours Studying from home: 17 hours	2
	Packaging materials, technologies and equipment	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - discern the functional performance and the main uses of containers in a variety of materials and textures - discern the characteristics of locks (capsules, lids and caps) in a variety of materials - recognise innovative and environmentally friendly packaging materials - adopt Smart packaging in order to extend the shelf life of food - apply analytical methods to monitor the performance of packaging materials - recognise the functionalities of machinery and equipment for inspecting, selecting and cleaning primary containers used in the agro-food industry - recognise the functionalities of machinery and equipment for the primary packaging of food products - recognise the functionalities of machinery and equipment for secondary packaging and shipment packaging 	Method: Written and/or practical examination. Criteria: Students must demonstrate that they are able to recognise the functionalities of material, machinery and equipment for food product packaging.	Classroom/workshop: 34 hours Studying from home: 17 hours	2
Manage technologies, machinery and systems used in the various supply chains in the agro-food sector, mastering the technological standards and seeking flexibility and production optimisation.	Milk and dairy production technologies I	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - identify the milk and dairy production line - map primary production and food transformation - understand and comply with the legislation in force on the milk and by-product chain - recognise and distinguish technologies, machinery and systems used in the milk and dairy product chain - recognise the functionalities of said technologies, machinery and systems - gain awareness of the technological trends in the sector 	Method: Written and/or practical examination. Criteria: Students must demonstrate that they can recognise the functionalities of technologies, machinery and systems used in the milk and dairy product chain.	Classroom/workshop: 20 hours Studying from home: 10 hours	1
	Grain, pasta and baked goods technologies I	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - identify the grain, pasta and baked goods chain - map primary production and food transformation - understand and comply with the legislation in force on the grain, pasta and baked goods chain - recognise and distinguish technologies, machinery and systems used in the grain, pasta and baked goods chain - recognise the functionalities of said technologies, machinery and systems - gain awareness of the technological trends in the sector 	Method: Written and/or practical examination. Criteria: Students must demonstrate that they can recognise the functionalities of technologies, machinery and systems used in the grain, pasta and baked goods chain.	Classroom/workshop: 20 hours Studying from home: 10 hours	1

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	Fermentation technologies for alcoholic beverages and vinegars I	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - identify the wine, alcoholic beverages and vinegars chain - map primary production and food transformation - understand and comply with the legislation in force on the wine, alcoholic beverages and vinegars chain - recognise and distinguish technologies, machinery and systems used in the wine, alcoholic beverages and vinegars chain - recognise the functionalities of said technologies, machinery and systems - gain awareness of the technological trends in the sector 	Method: Written and/or practical examination. Criteria: Students must demonstrate that they can recognise the functionalities of technologies, machinery and systems used in the wine, alcoholic beverages and vinegars chain.	Classroom/workshop: 20 hours Studying from home: 10 hours	1
	Technologies for fresh and preserved vegetables I	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - identify the fresh and preserved vegetables chain - map primary production and food transformation - understand and comply with the legislation in force on the fresh and preserved vegetables chain - recognise and distinguish technologies, machinery and systems used in the fresh and preserved vegetables chain - recognise the functionalities of said technologies, machinery and systems - gain awareness of the technological trends in the sector 	Method: Written and/or practical examination. Criteria: Students must demonstrate that they can recognise the functionalities of technologies, machinery and systems used in the fresh and preserved vegetables chain.	Classroom/workshop: 20 hours Studying from home: 10 hours	1
	Technologies for fresh, cured and preserved meats I	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - identify the fresh, cured and preserved meats chain - map primary production and food transformation - understand and comply with the legislation in force on the fresh, cured and preserved meats chain - recognise and distinguish technologies, machinery and systems used in the fresh, cured and preserved meats chain - recognise the functionalities of said technologies, machinery and systems - gain awareness of the technological trends in the sector 	Method: Written and/or practical examination. Criteria: Students must demonstrate that they can recognise the functionalities of technologies, machinery and systems used in the fresh, cured and preserved meats chain.	Classroom/workshop: 20 hours Studying from home: 10 hours	1
	Technologies for fish and fish-based preserves I	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - identify the fish and fish-based preserves chain - map primary production and food transformation - understand and comply with the legislation in force on the fish and fish-based preserves chain - recognise and distinguish technologies, machinery and systems used in the fish and fish-based preserves chain - recognise the functionalities of said technologies, machinery and systems - gain awareness of the technological trends in the sector 	Method: Written and/or practical examination. Criteria: Students must demonstrate that they can recognise the functionalities of technologies, machinery and systems used in the fish and fish-based preserves chain.	Classroom/workshop: 20 hours Studying from home: 10 hours	1

Learning outcomes of the course	Training units	Learning outcomes of the training unit	Outcome assessment methods and criteria	Learning methods and contexts and the related work loads (hours)	Number of credits ECTS
	Lectures are held at the company (apprenticeship /in-company training) I	During the apprenticeship students may exercise and apply autonomously the skills and knowledge acquired during the classroom/workshop lectures. In the first year, the apprenticeship takes as reference the technical and professional skills common to the agro-food sector (logistics and production process programming and management, control of safety and quality of production).	Method: Monitoring and testing the work performance of trainees with an assessment of the actual application of knowledge and skills. Self-evaluation and reprocessing of the experience by the students. Criteria: The preselected evaluation approach is subject to the company tutor's assessment and to the subsequent feedback with self-evaluation from the student, at the responsibility of the organization's teacher. The outcome of the combination between heterous and self-evaluation is the summary report of the experience, which will be one of the topics in the final examination.	Internship: 400 hours Studying at home and preparation of internship report: 173 hours The programming of the internship shall occur according to the following procedure: - Planning and preparation - Stipulation of internship agreement - Management and monitoring - Evaluation Students are also given the possibility of carrying out a partial or full internship in agro-food companies located abroad.	25
				TOTAL WORK LOADS (HOURS) - YEAR 1 1500	TOTAL NUMBER OF CREDITS ECTS (YEAR 1) 60

Matrix of learning outcomes and structure **Year 2**

Learning outcomes of the course	Training units	Learning outcomes of the training unit	Outcome assessment methods and criteria	Learning methods and contexts and the related work loads (hours)	Number of credits ECTS
Managing communication and relational processes within and outside the organization both in Italian and in English	English II	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - prepare and present technical reports in English - listen and resolve technical issues raised by foreign parties, providing due assistance - participate in meetings, tables, work meetings - follow work projects involving foreign partners autonomously - communicate effectively during visits, work transfers and/or participation in trade shows - manage any experiences in mobility abroad with communicative autonomy 	Method: Written multiple choice test and oral discussion in English. Criteria: Students shall provide proof of their mastery of the sectoral technical terminology and grammatical and syntactical correctness, as well as their fluency in conversational English.	Classroom: 36 hours Studying from home: 18 hours	2
Coordinate, negotiate and develop group work activities to tackle issues, put forward solutions, help to produce, order and assess group results	Team work	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - develop group work activities in order to tackle issues, put forward solutions, help to produce, order and assess group results - coordinate and negotiate solutions to work issues in a shared manner - collaborate proactively in team work - understand the role of team leader and of the various members of the work group (system of responsibilities) - develop collaboration skills - develop professional trust 	Method: Practical test Criteria: Students must demonstrate that, in a team work situation, they are able to collaborate, listen and put forward solutions.	Classroom/Outdoor Training: 20 hours Studying from home: 10 hours	1
Knowing the undertaking elements, the company's impact on the relevant local sector, the rules governing the life of the undertaking and its external relationships at national, European and international level	Food legislation II	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - take as reference the general principles and requisites of food legislation - apply the EC rules on food control and hygiene set out in the Hygiene Packet - check the traceability guarantee of food, feed and animals intended for food production - have knowledge of standard ISO 22005 on the Traceability System in the food and feed production line - interpret the EC Ordinance for the management of food safety: DG SANCO, RASFF, EFSA - conduct risk analysis - comply with the veterinary, public health and food hygiene controls 	Method: Written multiple choice test. Criteria: Students must demonstrate that they are familiar with the EC Regulations food control, hygiene and safety.	Classroom: 26 hours Studying from home: 13 hours	2
Gain knowledge of, analyse, apply and monitor, in the specific contexts, models for managing the production processes of goods and services, with a view to continuous improvement	Quality management techniques and performance management	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - analyse, monitor and control, as far as within one's competence, the production processes - make proposals and find solutions and alternatives for improving efficiency and the performance of technological and human resources employed in the production processes - employ continuous improvement models (Deming Cycle and PDCA approach to process management) - develop improvement programmes and performance indicators (KPI) - gain knowledge of standards ISO 9001:2015 for quality system certification and ISO 22000:2005 for food management safety systems - apply DOE techniques for continuous improvement of technologies (DOE) 	Method: Written examination with analysis of corporate case study Criteria: Students must demonstrate, based on a given corporate case study, that they know how to develop an improvement programme preparing performance indicators.	Classroom: 30 hours Studying from home: 15 hours	2

Learning outcomes of the course	Training units	Learning outcomes of the training unit	Outcome assessment methods and criteria	Learning methods and contexts and the related work loads (hours)	Number of credits ECTS
	Project management	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - apply the project management method and instruments in planning and managing their work - prepare the project plan and the planning "toolbox" - schedule the project activities according to the Work Breakdown Structure (WBS) model - prepare Gantt diagrams for the timing of the project - understand the allocation of responsibilities in the project team - monitor the state of progress of the project - assess the intermediate and final project results 	Method: Written examination with analysis of corporate case study Criteria: Students must demonstrate, based on a given corporate case study, that they know how to use correctly the project management tools.	Classroom: 36 hours Studying from home: 18 hours	2
Gain knowledge of the production and transformation processes in the agro-food specialisation areas	Production management and lean production	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - distinguish the various types of production and adopt criteria for selecting the production system based on the following: product project and level of quality, market features and necessary flexibility, requested quantity and production capacity, customization and level of service - apply models for classifying the production system (based on the market and on the volume of production) - discern the various types of manufacturing (by department, by cell, by production line) based on the sought match between process flexibility and product range - develop a production plan based on a time horizon (production planning and production scheduling) - apply the principles of Lean Manufacturing - understand the work flow in companies which have adopted Lean Production 	Method: Written examination with analysis of corporate case study Criteria: Students must demonstrate, based on a given corporate case study, that they can classify the production system and offer alternatives to the latter from a Lean production perspective	Classroom: 30 hours Studying from home: 15 hours	2
	Supply chain management and distribution logistics	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - clearly define the operating cycle of corporate logistics: supply, programming of production and product distribution and delivery - identify the various types of inventory (raw materials, semi-finished and finished goods) and their function within the production cycle - apply inventory management models - understand the various systems for stocking and picking goods at the warehouse - gain knowledge of and use automatic identification technologies (one-dimensional bar codes, two-dimensional QR codes, RFID, Near Field Communication for tracking the physical flow) - implement specific data warehouse and data mining systems 	Method: Written multiple choice and/or open-ended test. Criteria: Students must demonstrate that they have knowledge of the operating cycle of corporate logistics and their mastery of the main instruments of Supply Chain Management	Classroom: 28 hours Studying from home: 14 hours	2

Learning outcomes of the course	Training units	Learning outcomes of the training unit	Outcome assessment methods and criteria	Learning methods and contexts and the related work loads (hours)	Number of credits ECTS
Manage the production process according to the principles of environmental friendliness and sustainability	Environmental sustainability of agro-food production	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - apply the environmental and strategic impact assessment methods (VIA VAS) - during the life cycle of a food product, determine the impact in the following terms: emission of greenhouse gases (Carbon footprint), consumption and water use methods (Water footprint) and biologically productive surface area (land/water) required to provide resources and absorb emissions (Ecological footprint) - understand the steps for implementing a UNI EN ISO 14001:2015 certified environmental management system - assess the production cycle taking as reference the concept of Circular Economy - take actions for enhancing sub products and waste from the agro-food chain - gain knowledge of the industrial biotechnologies for improving food and beverage quality and safety (tailor-made microbic crops for the milk-dairy sector, the coldcuts industry, baked goods and the wine sector) 	Method: Written multiple choice and/or open-ended test. Criteria: Students must demonstrate that they are aware of the environmental impact caused by the agro-food production processes and must be able to put forward solutions for mitigating the latter, also from a Circular Economy perspective.	Classroom: 26 hours Studying from home: 13 hours	1.5
Put forward technological solutions which introduce innovative and competitive product and process elements	Product development lab (PW)	The training unit adopts the workshop method of Project Work to be carried out in subgroups. Each group must develop an innovative project for the design and development of a new product. The work must be carried out according to the following steps: 1) developing new product ideas based on consumer research 2) screening of ideas based on the level of complexity and preparation of a micro business plan for the new product, estimating the costs, revenues and investments necessary to implement the plan 3) classification of the new product and of the production cycle 4) testing: sensory testing of preference through visual, odour, sapid and tactile sensation perception 5) decision and transposition into the production context, quality, supply and logistics 6) developing a business plan for the launch of the new product	Method: Assessment of the Project Work results Criteria: The group must put forward innovative product solutions, putting their idea into the context of the relevant competitive horizon.	Project Work: 72 hours Studying from home: 36 hours	5.5
Manage technologies, machinery and systems used in the various supply chains in the agro-food sector, mastering the technological standards and seeking flexibility and production optimisation.	Milk and dairy production technologies II	At the end of the training unit students will have learnt how to: <ul style="list-style-type: none"> - identify the transformation processes for milk and its by-products - gain knowledge of the physical and chemical properties of milk and the micro organisms and dairy and anti-dairy bacteria linked to the processing technologies - identify pathogenic bacteria and harmful substances - interpret analytical findings related to processing activities - master technological process standards related to the technologies, machinery and systems used in the milk and dairy production chain. - manage the productive flexibility of said technologies, machinery and systems - seek objectives for optimising said technologies, machinery and systems 	Method: Written and/or practical examination. Criteria: Students must demonstrate that they can manage the technologies, machinery and systems used in the milk and dairy production chain.	Classroom/workshop: 46 hours Studying from home: 23 hours	2.5

Learning outcomes of the course	Training units	Learning outcomes of the training unit	Outcome assessment methods and criteria	Learning methods and contexts and the related work loads (hours)	Number of credits ECTS
	Grain, pasta and baked goods technologies II	<p>At the end of the training unit students will have learnt how to:</p> <ul style="list-style-type: none"> - identify the processes for transforming grain (wheat, barley, rice), semi-finished goods (groats and flour) and secondary processing products (fresh pasta and dry pasta, bread, bread sticks, cakes and snacks and pastry products) - gain knowledge of the physical and chemical properties, enzymatic activity and fermentation aptitude of grouts and flour - perform rheological tests for the technological behaviour of flour - distinguish the various types of leavening and yeasts requisites - identify the role of lactic bacteria in metabolic activities - master technological process standards related to the technologies, machinery and systems used in the grain, pasta and baked goods chain - manage the productive flexibility of said technologies, machinery and systems - seek objectives for optimising said technologies, machinery and systems 	<p>Method: Written and/or practical examination.</p> <p>Criteria: Students must demonstrate that they can manage the technologies, machinery and systems used in the grain, pasta and baked goods chain.</p>	<p>Classroom/workshop: 46 hours Studying from home: 23 hours</p>	2.5
	Wine making, alcoholic beverages and vinegars technologies II	<p>At the end of the training unit students will have learnt how to:</p> <ul style="list-style-type: none"> - identify the processes for the transformation of grapes, semi-finished goods (must), alcoholic drinks (wine, beer, distillates, etc.) and vinegars - gain knowledge of other wine making techniques (thermovinification, carbonic maceration, reduction with antioxidants, hyperoxidation, cryomaceration) - distinguish micro organisms and the use of sulphur dioxide in oenology - detect wine defects and diseases - master technological process standards related to the technologies, machinery and systems used in the wine, alcoholic beverages and vinegars chain - manage the productive flexibility of said technologies, machinery and systems - seek objectives for optimising said technologies, machinery and systems 	<p>Method: Written and/or practical examination.</p> <p>Criteria: Students must demonstrate that they can manage the technologies, machinery and systems used in the wine, alcoholic beverages and vinegars chain</p>	<p>Classroom/workshop: 46 hours Studying from home: 23 hours</p>	2.5

Learning outcomes of the course	Training units	Learning outcomes of the training unit	Outcome assessment methods and criteria	Learning methods and contexts and the related work loads (hours)	Number of credits ECTS
	Technologies for fresh and preserved vegetables II	<p>At the end of the training unit students will have learnt how to:</p> <ul style="list-style-type: none"> - identify the processes for the transformation of fresh fruits and vegetables (tomato, vegetables, fruit) and of the main by-products (peeled tomatoes and tomato paste, tomato sauce, tomato pulp, sauces, dehydrated preserves, quick-frozen, in oil, in vinegar, fruit juices, fruit jams and marmalades) - recognise the classification of juices and fruit jams - discern intrinsic (acidity and pH, water activity) and extrinsic (thermal treatment and preservation temperature) stability factors - identify microbiological hazards which can be associated with vegetable preserves - master technological process standards related to the technologies, machinery and systems used in the fresh and preserved vegetables chain - manage the productive flexibility of said technologies, machinery and systems - seek objectives for optimising said technologies, machinery and systems 	<p>Method: Written and/or practical examination.</p> <p>Criteria: Students must demonstrate that they can manage the technologies, machinery and systems used in the fresh and preserved vegetables chain</p>	<p>Classroom/workshop: 46 hours Studying from home: 23 hours</p>	2.5
	Technologies for fresh, cured and preserved meats II	<p>At the end of the training unit students will have learnt how to:</p> <ul style="list-style-type: none"> - identify the processes for the transformation of (red and white) meat, coldcuts, seasoned cooked and uncooked sausages and meat-based preserves - recognise the types of intestines, additives and substances added in the production of coldcuts - carry out the monitoring of microbic populations in coldcuts - identify the micro-organisms agents of deterioration in meat and pathogens, the defects in seasoned coldcuts due to poor ventilation, excess humidity and insufficient change of air - perform sensory tests - master technological process standards related to the technologies, machinery and systems used in the fresh, seasoned and preserved meat chain - manage the productive flexibility of said technologies, machinery and systems - seek objectives for optimising said technologies, machinery and systems 	<p>Method: Written and/or practical examination.</p> <p>Criteria: Students must demonstrate that they can manage the technologies, machinery and systems used in the fresh, seasoned and preserved meat chain</p>	<p>Classroom/workshop: 46 hours Studying from home: 23 hours</p>	2.5
	Technologies for fish and fish-based preserves II	<p>At the end of the training unit students will have learnt how to:</p> <ul style="list-style-type: none"> - identify the transformation processes for fish, molluscs and fishery products - identify the causes of deterioration of fresh products - implement farmed fish control measures - manage import from European countries and from third countries, protecting the undertaking from business fraud and health fraud - master technological process standards related to the technologies, machinery and systems used in the fish and canned fish chain - manage the productive flexibility of said technologies, machinery and systems - seek objectives for optimising said technologies, machinery and systems 	<p>Method: Written and/or practical examination.</p> <p>Criteria: Students must demonstrate that they can manage the technologies, machinery and systems used in the fish and canned fish chain.</p>	<p>Classroom/workshop: 46 hours Studying from home: 23 hours</p>	2.5

Learning outcomes of the course	Training units	Learning outcomes of the training unit	Outcome assessment methods and criteria	Learning methods and contexts and the related work loads (hours)	Number of credits ECTS
	The apprenticeship takes place at the company (apprenticeship/ in-company training) II	During the apprenticeship students may exercise and apply autonomously the skills and knowledge acquired during the classroom/workshop lectures. The second year of apprenticeship takes as reference the distinctive technical and professional skills related to machinery and equipment, with the related technological process standards of a specific chain.	Method: Monitoring and testing the work performance of trainees with an assessment of the actual application of knowledge and skills. Self-evaluation and reprocessing of the experience by the students. Criteria: The preselected evaluation approach is subject to the company tutor's assessment and to the subsequent feedback with self-evaluation from the student, at the responsibility of the organization's teacher. The outcome of the combination between heterous and self-evaluation is the summary report of the experience, which will be one of the topics in the final examination.	Internship: 400 hours Studying at home and preparation of internship report: 230 hours The programming of the internship shall occur according to the following procedure: - Planning and preparation - Stipulation of internship agreement - Management and monitoring - Evaluation Students are also given the possibility of carrying out a partial or full internship in agro-food companies located abroad	25
				TOTAL WORK LOADS (HOURS) - YEAR 2	TOTAL NUMBER OF CREDITS ECTS (YEAR 2)
				1500	60

TOTAL WORK LOADS (HOURS) - YEAR 1 + YEAR 2	3000	TOTAL NUMBER OF CREDITS ECTS (year 1+ year 2)	120
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Rules of progression (preparatory condition)

The success of the training at the end of the first year, represented by the achievement of 60 credits, is a precondition for access to the second year of the course.

At the end of the second year, upon completion of the course, the diploma of Higher Technician is obtained after having passed a final examination. The diploma indicates the technological area and the relevant national figure, which grants access to the public competitions and to Universities with the recognition of university training credits. The EUROPASS certificate is also issued in Italian and in English.

The course, if successfully completed, is equated to the period of apprenticeship required for participation in the state exams qualifying for the profession of Agricultural Expert.

Mobility window

Students are also given the possibility of completing the internship, in whole or in part, at agro-food companies located abroad. Credits will be recognised without the need for the course participant to carry out any further activity or learning test.

Flexibility/customisations

To bring students' skills into alignment at the beginning of the course, foundation courses in Biology (21 hours), Chemistry (34 hours), Mathematics and applied statistics (12 hours) and English (20 hours) are provided. These hours are additional to the total hours envisaged in the course.

Course venue

FONDAZIONE ITS TECH & FOOD C/O CISITA PARMA Scarl
Borgo Girolamo Cantelli 5 – 43121 Parma (PR)