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RÉPUBLIQUE FRANÇAISE
MINISTÈRE
DE L'ENSEIGNEMENT SUPÉRIEUR
ET DE LA RECHERCHE

Higher technician certificate

“Techniques and Services in Agricultural Equipment »

September 2013

FRENCH REPUBLIC

Ministry of Higher Education and Research

Order of April 8, 2013

defining and setting the conditions for the issuance of the higher technician certificate "techniques and services in agricultural equipment "

NOR: ESRS1307506A

The Minister of Higher Education and Research

Having regard to decree no. 95-665 of May 9, 1995 amended on the general regulations for the technician's patent superior ;

Considering the decree of May 9, 1995 fixing the conditions of authorization to implement the control in progress training for the issue of the professional baccalaureate, the professional certificate, and the higher technician certificate;

Considering the decree of May 9, 1995 relating to the positioning with a view to the preparation of the professional baccalaureate, the professional certificate and the higher technician certificate;

Considering the decree of June 24, 2005 fixing the conditions of exemptions of units to the patent of higher technician;

Having regard to the opinion of the “metallurgy” professional consultative commission dated 28 January 2013;

Having regard to the opinion of the National Council for Higher Education and Research of March 18, 2013;

Considering the opinion of the Superior Council of Education of March 21, 2013 ;

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Section 1

The definition and the conditions of delivery of the certificate of higher technician "techniques and services in agricultural equipment" are fixed in accordance with the provisions of this order.

Section 2

The reference framework for professional activities and the certification reference system are defined in appendix I to this order.

The constituent units of the certification reference system for the "technical and services in agricultural equipment" higher technician diploma are defined in appendix IIa to this order.

Appendix IIb specifies the units common to the higher technician certificate "techniques and services in agricultural equipment" and to other specialties of the higher technician certificate.

Section 3

The examination regulations are set out in appendix IIc to this decree. The definition of one-off tests and evaluation situations during training is set out in appendix IId to this order.

Section 4

In initial training under school status, lessons enabling the skills required of the senior technician to be attained are provided in accordance with the weekly timetable appearing in appendix IIIa to this order.

Section 5

The training sanctioned by the "technical and service in agricultural equipment" technician's certificate includes internships in a professional environment, the purposes and duration of which are required to sit for the examination are specified in Appendix IIIb to this order.

Section 6

For each examination session, the closing date of the registration registers and the start date of the practical or written tests are set by the Minister responsible for National Education.

The list of documents to be provided when registering for the exam is fixed by each recteur.

Section 7

Each candidate registers for the examination in its overall form or in its progressive form in accordance with the provisions of articles 16, 23, 23 bis, 24 and 25 of the decree of May 9, 1995 referred to above.

In the case of the progressive form, the candidate specifies the tests or units that he wishes to take during the session for which he is registering.

The "technical and services in agricultural equipment" higher technician certificate is issued to candidates who have successfully passed the examination defined by this decree in accordance with the provisions of Title III of the decree of May 9, 1995 referred to above.

Section 8

The correspondence between the examination tests organized in accordance with the decree of September 3, 1997 as amended defining and setting the conditions for the issue of the "agricultural equipment" senior technician certificate and the examination tests organized in accordance with this decree are specified. in Annex IV to this Order.

The period of validity of marks equal to or greater than 10 out of 20 in the examination papers taken in accordance with the provisions of the decree of 3 September 1997 mentioned above and for which the candidate requests the benefit under the conditions provided for in the preceding paragraph, is deferred within the framework of the examination organized according to the provisions of this decree in accordance with article 17 of the decree of May 9, 1995 referred to above and from the date of obtaining this result.

Section 9

The first session of the higher technician's certificate "techniques and services in agricultural equipment" organized in accordance with the provisions of this decree will take place in 2015.

The last session of the "agricultural equipment" senior technician certificate organized in accordance with the provisions of the amended decree of 3 September 1997 defining and setting the conditions for issuing the "agricultural equipment" senior technician certificate will take place in 2014. At the end of this session, the aforementioned decree of September 3, 1997 is repealed.

Section 10

The Director General for Higher Education and Professional Integration and the rectors are responsible, each as far as they are concerned, for the execution of this decree which will be published in the Official Journal of the French Republic.

Done on April 8, 2013

For the Minister and by delegation In
the absence of the Director General for Higher Education and Professional Integration The Head of
Department for the Strategy of Higher Education and Professional Integration, JM JOLION

Published in the Official Journal of the French Republic of April 23, 2013

Published in the Official Bulletin of Higher Education and Research of May 23, 2013

SUMMARY

APPENDIX I

DIPLOMA REFERENCES

APPENDIX I a

ACTIVITY FRAMEWORK PROFESSIONALS

1. PRESENTATION OF THE SENIOR TECHNICIAN TECHNIQUES AND AGRICULTURAL EQUIPMENT SERVICES

Branch of activity

The Technical and Services BTS in Agricultural Equipment gives access to jobs in the agricultural equipment maintenance and after-sales sector.
The activities of this sector include in particular:

- The relationship with customers with specific needs, • The management of the main stages in the life of equipment (provision, maintenance, adaptation, compliance, deconstruction, etc.),
- The relationship with manufacturers of agricultural equipment,
- Service activities and advice related to the maintenance of equipment agricultural,
- The constant evolution of technological innovations and regulations

The context of professional activities

The business is mainly exercised in: • Manufacturers' after-sales network companies, • Independent companies or networks of independents, • Manufacturers' after-sales services, • Independent bodies whose activity is related with the field of agricultural equipment, for example in terms of control or expertise.

In each case, the business mobilizes:

- Technical skills in the various aspects of maintenance and the environment of use of agricultural equipment, • Skills in after-sales management and organization, • Communication skills, in particular to meet the expectations of the customer base,
- Capacities for teamwork and exchanges with the internal departments of company and with external partners.

The common denominator of all the activities described below is the constant integration of three imperatives: Imperative of **HEALTH/SAFETY/ENVIRONMENT :** it is a question of preserving the health of people, ensuring their safety while preserving the goods and the environment.

QUALITY imperative : it is a question of contributing to the constant improvement of customer satisfaction by integrating a process of progress in all activities.

ECONOMIC imperative : cost imperatives must be constantly taken into account in the activities of the senior technician in relation to company policy.

2. JOB AND DUTIES OF THE TECHNICAL AND SERVICE TECHNICIAN IN AGRICULTURAL EQUIPMENT

They are located

within: construction companies,
maintenance and after-sales companies for agricultural machinery and equipment,
CUMAs and EDTs (formerly ETARF) with an integrated maintenance service,
independent bodies including the he activity is related to the field of agricultural equipment, for example in terms of control or expertise.

as :

Workshop manager or workshop foreman : • Management of workshop activity, • Management of technical relations with manufacturers, • Management of guarantees and disputes, • Promotion, sale of products and additional services, • Quality management .

Team leader : • Customer reception, • Intervention planning, • Team and customer training facilitation, • Technical expertise, maintenance management, • Equipment adaptation.

After-sales technician :
• High-tech diagnosis and assistance with intervention, • Technical advice: “product” referent, • Monitoring of developments, • Start-up, demonstration, • Follow-up of files and customer relations.

Technical advisor for a manufacturer : • Animation of the network platform, • Technical assistance for maintenance companies, • Animation and training of after-sales service for distribution networks, • Technical support for internal departments (testing, certification, marketing, etc.) .

Advisor or expert to independent organizations (emerging professions) • Technical advice, • Regulatory control, • Technical and legal expertise.

3. ACTIVITIES AND TASKS OF THE SENIOR TECHNICIAN IN AGRICULTURAL EQUIPMENT AND SERVICES

Activities		Main tasks Support the
A1- Welcoming and advising the client or user. Receipt, return or provision of equipment.	**1T1**	customer or user, perform a pre-diagnosis.
	1T2	Write the repair order, make an appointment and plan the intervention.
	1T3 Receive the material.	
	1T4	Carry out pre-diagnostic tests, draw up an estimate.
	1T5	Present, explain the intervention and the elements of invoicing to the client.
	1T6 Deliver the material ordered by the customer	
A2-Diagnosis	**2T1**	Collect, analyze, interpret the information necessary for the diagnosis
	2T2	Carry out tests, static or dynamic tests and make hypotheses on the malfunction
	2T3	Interpret the results, identify the defective component(s), propose the intervention to be carried out
A3- Intervention – Preparation	**3T1**	Organize the intervention
	3T2 Organize the preparation of materials	
	3T3 Advise and assist technicians	
	3T4	Validate the result of the intervention or the compliance of the preparation with the sales contract
	3T5 Set up or configure an on-board system **4T1** Manage workshop	
A4-Organization and management of after-sales activities	activity planning **4T2** Analyze a workshop management dashboard.	
	4T3 Manage workshop equipment **4T4**	
	Implement a quality approach **5T1**	
A5-Human resources, facilitation, training		Lead and supervise a team of workshop technicians
	5T2 Contribute to training	
A6-Adaptation of equipment	**6T1**	Analyze the need and write the specifications
	6T2	Research, choose and propose a solution adapted to the customer's needs
	6T3	Ensure the follow-up of the realization and the provision to the customer
A7- Advice on agro-technical	**7T1**	Propose equipment relating to phytotechnical or zootechnical production
	7T2 Ensure the implementation of equipment	
	7T3	Propose solutions to reduce production costs in a sustainable development approach
A8 – Sale of complementary products, equipment or services	**8T1**	Participate in the development of additional sales support tools
	8T2 Determine the need(s)	
	8T3 Look for a service or sales solution	
	8T4	Propose by arguing the service or sales solution

Activity A1 – Welcoming and advising the client or user. Receipt, return or provision of equipment.

Task 1T1: support the customer or user, carry out a preliminary diagnosis.

1 – Description of the task

• Greet the customer or user. • Take charge of a request from a client for a pre-diagnosis, an appointment you or information. • Listen and collect information provided by the client or user. • Analyze this information. • Question the client or user in order to complete the symptoms described. • Make dysfunction hypotheses.

2 – Starting situation

• The client or user arrives with a need.

3 – Conditions of achievement

3.1 – Means •

Communication tools. • The informatic tool. • Technical documentation.

3.2 – Links •

The customer and/or the user. • Services within the company. • Suppliers. • The constructor.

3.3 – References and resources

• Maintenance recommendations. • The history of upkeep and maintenance operations. • Technical notes. • Company acceptance procedures. • The company's quality approach.

4 – Expected results •

The reception is courteous, it allows customer loyalty. The response time is negotiated.

• All customer requests are identified and taken into account. • The questioning is adapted, it makes it possible to collect all the information necessary for diagnosis or intervention.

• Administrative acceptance procedures are applied and compliant. • Failure hypotheses are complete and correct. • Conducting the business helps prevent conflicts and legal disputes.

5 – Autonomy

Task 1T2: write the repair order, make an appointment and plan the intervention.

1 – Description of the task • Open and write the appropriate repair order. • Contact the customer or user and schedule the appointment. • Plan and schedule preventive and/or curative maintenance operations. • Plan and schedule warranty or technical recall operations builder. • Manage intervention schedules. • Propose a response time.

2 – Starting situation

• The client or user comes with a need. • The workshop load plan. • The good of the client.

3 – Conditions of achievement 3.1 –

Means • Communication tools. • The workshop load plan. • The informatic tool. • Management and planning tools. • The repair order to be completed.

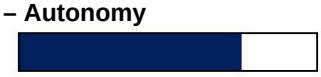
3.2 – Links • The customer or the user. • Services within the company. • Suppliers. • The constructor.

3.3 – References and resources • Maintenance recommendations. • The history of upkeep and maintenance operations. • The manufacturer's and/or supplier's technical documentation. • The manufacturer's technical notes. • The company's quality approach.

4 – Expected results

• The repair order is filled out correctly. • Appointments are made correctly. • The proposed response time is adapted, it is accepted by the customer or the user. • The customer's constraints related to the immobilization of its equipment are taken into account (deadlines, provision of replacement equipment, etc.). • The load plan is consistent, it incorporates all time constraints. • The planned organization helps build customer loyalty. • Repairs are integrated without disrupting the initial load plan. • Conducting the business helps prevent conflicts and legal disputes.

5 – Autonomy



Task 1T3: receive the material.

1 – Description of the task • Greet the customer or user. • Carry out the administrative reception of the equipment. • Support customer hardware. • Manage the provision of replacement equipment according to the agreements past. • Define the storage area. • Research technical information.

2 – Starting situation

• The client or user comes with a piece of equipment. • The technician works on the equipment at the dealership or at the customer's. • The repair order is open.

3 – Conditions of realization 3.1 –

Means • The property of the client. • The material tracking file. • Technical documentation.

3.2 – Links • The customer and/or the user. • Services within the company. • Suppliers. • The constructor.

3.3 – References and resources • Interview history. • Technical notes. • Company acceptance procedures. • The company's quality approach.

4 – Expected results

• Administrative acceptance procedures are applied and compliant. • The vehicle condition report is validated by the customer. • The proposed response time is adapted, it is accepted by the client. • The repair order is signed by the customer and the receiver. • Equipment is placed in an appropriate area. • Conducting the business helps prevent conflicts and legal disputes.

5 – Autonomy

Task 1T4: carry out pre-diagnostic tests, draw up an estimate.

1 – Description of the task

• Carry out orientation tests (visual, auditory, olfactory, etc.). • Research technical information. • Decode, analyze the information provided by the hardware self-diagnosis. • Question the client or user in order to complete the symptoms described. • Prepare an estimate. • Check the availability of components. • Finalize the repair order and have it accepted by the customer. • Propose a response time.

2 – Starting situation

• The repair order is opened and signed by the customer. • Faulty equipment is made available.

3 – Conditions of achievement 3.1 –

Means • The equipment tracking file. • The technical documentation of the equipment. • The informatic tool. • Diagnostic tools.

3.2 – Links • The customer and/or the user. • Services within the company. • The constructor. • Suppliers.

3.3 – References and resources • Maintenance recommendations. • The history of upkeep and maintenance operations. • Technical notes. • The company's quality approach.

4 – Expected results

• The choice and implementation of orientation tests are relevant. • All necessary technical information is collected and taken into account. • The estimate is consistent with the work to be done, it is accepted by the customer. • The established repair order complies with the work to be carried out, it is clearly written and comprehensive.

• The proposed response time is adapted, it is accepted by the client. • Conducting the business helps prevent conflicts and legal disputes.

5 – Autonomy

Task 1T5: present and explain the intervention and billing elements to the client.

1 – Description of the task

• Report on the work carried out. • Advise the client or user on the rules for using his equipment and/or on a monitoring plan in order to avoid the repetition of the initial malfunction if necessary.

• Explain to the customer or user the billing elements related to the order of repair.

• In the event of refusal and difficulties, manage any conflicts. • Return the material to the customer.

2 – Initial situation • The interventions have been carried out. • The presence of the client or user.

3 – Conditions of achievement 3.1 –

Means • The equipment tracking file. • Technical documentation. • The invoice.

3.2 – Links • The customer or the user. • The store and the workshop. • Commercial service. • The administrative service.

3.3 – References and resources • The repair order. • Maintenance recommendations. • The company's quality approach.

4 – Expected results

• The reception is courteous, the report is coherent and structured, the language is adapted to the type of clientele.

• Technical advice concerning the rules for using the material or the operation of equipment is appropriate.

• The explanations concerning the elements invoiced are clear, argued, coherent and structured. •

Payment is collected according to company rules. • The conflict is managed in compliance with the legal texts with a concern for loyalty client.

• Conducting the business helps prevent conflicts and legal disputes.

5 – Autonomy

Task 1T6: Deliver the material ordered by the customer

1 – Description of the task

• Have the customer note the compliance of the equipment with the sales contract. • Explain to the customer the different manipulations for handling the equipment by completely safe.

• Provide the customer with the contractual and regulatory documents. • Hand over the material to the customer **2 – Starting situation**

• The material conforming to the sales contract is ready to be delivered to the customer.

3 – Conditions of realization

3.1 – Means

• The sales contract • The preparation report is produced.

3.2 – Links

• The customer

• Company services **3.3 – References and resources**

• Equipment documentation. • User, maintenance and warranty manuals. • The certificate of conformity for second-hand equipment. • Any regulatory document.

4 – Expected results

• The customer has noted the conformity of the equipment delivered.

• The customer has received advice on use and safety. • The customer has received all the documents, regulatory or not, relating to the equipment. • The customer signs the regulatory documents including the delivery note.

5 – Autonomy

Activity A2 - Diagnosis

Task 2T1: collect, analyze, interpret the information needed for diagnosis.

1 - Description of the task

• Check and interpret the indications given on the repair order. • Identify the hardware and its embedded systems. • Search for the technical documentation relating to the equipment to which the intervention relates. • Exploit the hardware history. • Check whether the symptom noted on the equipment has already been the subject of a technical note from the builder.

• Record and interpret using the manufacturer's diagnostic tool (on-board instrument or computer) the technical data and any error codes.

• If necessary, contact and dialogue with the manufacturer's technical services. • Synthesize the information collected and make assumptions about failures possible.

• Decide on the need and the nature of tests to validate the hypotheses.

2 - Starting situation

• Malfunctioning equipment or customer expectation (addition of option, modification of hardware parameter…).

3 - Conditions of realization 3.1 -

Means • The repair order, the equipment. • Technical documentation. • Modern communication tools. • Diagnostic tools.

3.2 - Connections

• The client. • The receiver. • The manufacturer's technical platform.

3.3 - References and resources

• The manufacturer's recommendations. • The history of upkeep and maintenance operations. • Technical notes. • The company's quality approach.

4 - Expected results • The customer's declarations mentioned on the repair order are verified and interpreted properly.

• The material is completely and precisely identified. • All the technical data is gathered and corresponds to the need. • The use of communication and diagnostic tools is mastered. • Data processing is fair and consistent. • The decision to perform a trial is timely.

5 - Autonomy

Task 2T2: carry out the tests, the static or dynamic tests and make hypotheses on the malfunction.

1 - Description of the task

• Identify on the equipment the systems, subsystems or elements that may be incriminated. • Propose a methodology and the conditions of a test, a static or dynamic test in related to the malfunction.

• Conduct the test, the trial, integrating the constraints of hygiene, safety, methodologies of the manufacturer with the possible presence of the customer. • Collect and organize the findings and information revealed during the test, the trial. • Produce a summary of the results of the test, of the trial, establishing a coherent relationship between the observed effect and the probable cause.

2 - Starting situation

• Malfunctioning equipment or customer expectation (addition of option, modification of equipment parameter, etc.).

3 - Conditions of realization

3.1 - Means •

The repair order. • Control and measurement benches and equipment.

3.2 - Liaisons •

The receiver. • The customer.

3.3 - References and resources

• The manufacturer's methodologies. • The instructions for the measuring benches. •

The regulatory conditions allowing to carry out tests, dynamic tests and static. •

Technical documentation.

4 - Expected results

• The identification of the systems, subsystems or elements that may be incriminated is consistent with the stated symptoms. • The methodology and the conditions of the tests, of the tests envisaged are related to the malfunction.

• Tests and trials are carried out in safety for people and property. • The results collected are clear, useful and usable in a diagnostic process or validation of proper functioning of a system. • The hypotheses envisaged are correctly argued and prioritized. • The proposed summary clearly highlights the “cause and effect” relationship between the incriminated element and the malfunction.

5 - Autonomy

Task 2T3: interpret the results, identify the defective component(s), propose the intervention to be carried out.

1 - Description of the task

• Compare measurement results to reference values. • Determine the differences between the measurements and the reference values.

• Establish the “cause-effect(s)” relationship between the identified symptom and the erroneous quantity.

• Associate the elements or information that contribute to the faulty function. • Find, if possible, the origin of the problem (which could have led to the failure of the components)).

• Make assumptions about the possible other consequences in the environment of the the failure observed. • Look for additional control conditions. • Implement these new controls. • Validate the conformity of the functions tested and the components linked to them. • Search, using the technical information tools, for the components to be replaced or intervention to be carried out (calibration, configuration, reprogramming, etc.).

2 - Starting situation

• Malfunctioning equipment or customer expectation (addition of option, modification of parameter of the machine or equipment…).

3 - Conditions of realization

3.1 - Means •

Technical documentation. • Diagnostic tools. • Control and measurement equipment.

3.2 - Connections

• Manufacturer's technical platform The customer or the user

3.3 - References and resources

• Maintenance recommendations. • The history of upkeep and maintenance operations. • The manufacturer's technical documentation. • The manufacturer's technical notes. • Test reports.

4 - Expected results

The results of checks and measurements are correctly interpreted.
The interpretation of the information and findings collected is fair and consistent.
Defective functions and components are clearly identified.
The intervention to be carried out is relevant.

5 - Autonomy

Activity A3 – Response - Preparation

Task 3T1: Organize the intervention

1 – Description of the task

• Learn about diagnostic results and intervention procedures. • Define the validation process. • Define the work area and organize the workstation. • Define or adapt the intervention procedures and choose the technician accordingly. • Take into account professional and environmental risks. • Provide adequate equipment and tools. • Provide spare parts and consumables.

2 – Starting situation

• The material.

3 – Conditions of realization

3.1 – Means •

Equipment and tools. • The repair order.

3.2 – Links

• The constructor. •
Suppliers. • The shop.

3.3 – References and resources

• Maintenance recommendations. •
Manufacturers' technical documentation. • Manufacturers' technical notes. • Documentation of equipment and tools.

4 – Expected results

• The organization of the intervention is consistent with the repair order and complies with the procedures.

• Hygiene, safety and environmental rules are respected. • The parts request is correct.

5 – Autonomy

Task 3T2: organize the preparation of materials

1 – Description of the task •

Familiarize yourself with the sales contract (type of equipment, options, etc.). • Receive new or used equipment. • Check compliance with the sales contract. • Study the technical documentation made available by the suppliers. • Define the assembly operations and settings that will be required.

2 – Starting situation

• New or used equipment.

3 – Conditions of realization

3.1 – Means

• Communication tools • IT tool • Technical documentation • Sales contract **3.2 – Links**

• The customer or user. • Services within the company. • Suppliers. • The constructor.

3.3 – References and resources

• Recommendations for assembly or preparation of new equipment. • Technical notes.
• Company acceptance procedures. • The company's quality approach.

4 – Expected results

• Reading the sales contract makes it possible to gather the right information on the configuration desired by the customer.
• The preparation operations determined from the technical documentation are understood.
• No assembly or configuration operation is forgotten.

5 – Autonomy

Task 3T3: advise and assist technicians

1 – Description of the task

• Ensure the smooth running of the intervention or preparation • Identify the difficulties in the intervention or preparation • Analyze the progress of the technician's intervention. • Compare the difference between the required intervention and the estimate (items, cost, deadlines). • Search for additional information. • Look for complementary intervention solutions and adapt procedures. • Inform the customer. • Expose the solutions. • Write a help or advice document. • Validate the procedures implemented.

2 – Starting situation

• The intervention to be carried out. • Preparation of new or used equipment **3 – Conditions of realization**

3.1 – Means •

The manufacturer's documents. • Equipment. • The tools. • Technical information from the sales contract.

3.2 – Links

• Assistance from manufacturers. • The technician involved. • The customer. • Services within the company. • Suppliers.

3.3 – References and resources

• Recommendations for maintenance, assembly or preparation of equipment • Manufacturers' technical documentation. • Manufacturers' technical notes. • Documentation of equipment and tools. • The workshop organization schedule.

4 – Expected results

• The description of the work to be done and the advice to the technician involved are clear and precise.

• Hygiene, safety and environmental rules are respected. • Intervention solutions are relevant. • The operations planning is compatible with the workshop planning. • The report of the intervention or the preparation is carried out.

5 – Autonomy

Task 3T4: Validate the result of the intervention or the conformity of the preparation of the material

1 – Description of the task

• Take into account the intervention validation process. • Learn about performance monitoring procedures. • Prepare materials and measuring devices. • Carry out the tests. • Analyze the results obtained. • Carry out corrective adjustments, or plan the necessary modifications. • Validate the results of the intervention or the conformity of the preparation of the material and report

account.

2 – Starting situation

• Equipment after intervention. • New or used equipment prepared for delivery to the customer. • The technician's report.

3 – Conditions of realization

3.1 – Means •

The equipment and accessories available in the company. • The sales contract • The services available in the company. • The informatic tool.

3.2 – Links

• The customer or user. •

Services within the company. • The constructor. • Supplier.

3.3 – References and resources

• Recommendations for maintenance, assembly or preparation of equipment. • Manufacturers' technical documentation. • Manufacturers' technical notes. • The company's quality approach.

4 – Expected results

• The tests made it possible to verify correct operation. • The tests are carried out under optimal safety conditions. • Any possible anomaly is reported. • The material is ready to be handed over to the client and conforms to the contract.

5 – Autonomy

Task 3T5: Parameterize or configure an embedded system

1 – Description of the task

• Dialog with embedded systems. • Update calculator software. • Communicate with the manufacturer's assistance platform. • Configure and debug systems and components.

2 – Starting situation

• Equipment during a maintenance operation. • The customer's need.

3 – Conditions of realization

3.1 – Means •

Equipment and tools. • The diagnostic tool.

3.2 – Links

• The customer • The manufacturer **3.3 – References and resources**

• Maintenance recommendations. • Manufacturers' technical documentation. • Manufacturers' technical notes. • Documentation of equipment and tools.

4 – Expected results

• The configurations carried out respect the manufacturer's data and procedures. • The configuration corresponds to the customer's expectations. • Precautions for the prevention of occupational risks are respected.

5 – Autonomy

Activity A4 – Organization and management of after-sales activities

Task 4T1: manage the planning of workshop activities.

1 – Description of the task

• Assign technicians the work to be carried out according to their skills and workload taking into account the availability of tools.

• Enforce the intervention procedures specific to the manufacturer and service provider. • Plan the monitoring and control of interventions. • Organize activities taking into account the hazards in order to meet deadlines. • Enforce the rules of hygiene, safety, ergonomics and respect for the environment.

2 – Starting situation

• Workshop activities to plan.

3 – Conditions of realization

3.1 – Means •

The planning of preventive and curative maintenance tasks. • The personnel concerned, their skills and their availability. • Repair orders. • Tools • Work planning tools. • Maintenance and warranty constraints.

3.2 – Connections

• Company services. • Workshop teams. • Suppliers and builders.

3.3 – References and resources • The history of servicing and maintenance operations. • Documentation and technical means. • Company quality procedures. • Hygiene, safety, ergonomics and environmental rules.

4 – Expected results • The work is correctly distributed and planned according to the skills and the availability of technicians. • Workload is optimized.

5 – Autonomy

Task 4T2: analyze a workshop management dashboard.

1 – Description of the task

• Collect the necessary data and populate the dashboards of the workshop. • Compare the various indicators of the dashboard in relation to the objectives • Identify the critical indicators and identify the cause of the differences in results. • Identify the corrective actions to be implemented in order to achieve the objectives • Apply and enforce the corrective actions decided with the hierarchy. • Evaluate the effectiveness of corrective actions

2 – Starting situation

• A maintenance workshop in operation.

3 – Conditions of realization

3.1 – Means •

Company dashboards. • The informatic tool. • Management and planning software.

3.2 – Liaisons •

Technicians. • The foreman. • The constructor. • The company's management.

3.3 – References and resources •

Workshop management indicators. • The manufacturer's instructions. • The company's quality approach. • History of workshop activity.

4 – Expected results

• The dashboards are filled in regularly and correctly. • Any anomaly in the results is detected, reported and analyzed. • Corrective actions are proposed, those that are validated are implemented. • The effectiveness of these corrective actions is measured and adjustments are proposed if needed.

5 – Autonomy

Task 4T3: manage workshop equipment.

1 – Description of the task

• Escalate tooling needs to the hierarchy. • Ensure and organize the reception and installation of tools and equipment.

• Become familiar with the operating modes of new equipment. • Proceed to the updating of equipment, ensure the follow-up of their maintenance and the controls provided for by the regulations.

• Inform the teams about new equipment and tools, their methods of use, precautions for use, location and storage.

2 – Starting situation

• The company's various workshops.

3 – Conditions of realization

3.1 – Means •

Tools. •

Equipment. • The informatic tool.

3.2 – Liaisons •

Workshop teams. • The foreman.

• Manufacturers or suppliers of equipment.

3.3 – References and resources •

Documentation and technical notes from manufacturers and suppliers. • Maintenance contracts. • The regulations relating to the conditions of use of the equipment.

4 – Expected results • The tools and equipment are identified, updated, compliant and stored. • The equipment proposals comply with the manufacturers' specifications and the company's policy in terms of equipment. • The use of new equipment is mastered.

5 – Autonomy

Task 4T4: implement a quality approach

1 – Description of the task

• Analyze the performance and operation of the workshop, • Find the causes of failures and assess their impact. • Propose progress actions. • Apply and enforce the progress actions validated by the hierarchy. • Evaluate the effects of corrective actions.

2 – Initial situation •

Permanently.

3 – Conditions of realization

3.1 – Means •

Completed dashboards. • Customer satisfaction data. • Dedicated IT tools.

3.2 – Links •

Manufacturers. • Company services. • The technicians. • Customers.

3.3 – References and resources • Activity history. • Workshop dashboards. • Customer satisfaction surveys and work resumptions • The quality approach of the company and the builder.

4 – Expected results • The analysis of the indicators makes it possible to identify the causes of customer dissatisfaction. • Recommendations make it possible to improve the procedures for monitoring materials.

• Progress actions are proposed, those that are validated are put in place. • The effectiveness of these progress actions is measured and adjustments are proposed if needed.

5 – Autonomy

Activity A5 – Human resources, facilitation, training

Task 5T1: leading and supervising a team of workshop technicians.

1 – Description of the task

• Communicate the objectives to be achieved and the means necessary to achieve them. • Listen and analyze the proposals developed by the technicians. • Appreciate all technicians by promoting team dynamics. • Inform the technicians of the results. • Realize.

2 – Beginning situation

• The activity situations of the workshop.

• An evolution of the organization, procedures and resources

3 – Conditions of realization

3.1 – Means

• Human resources. • Communication tools. • Material means.

3.2 – Liaisons

• A team of workshop technicians. • The other teams. • The hierarchy. • The prescriber or the external sponsor at the origin of the evolution.

3.3 – References and resources

• Information provided by manufacturers or suppliers. • Workshop dashboards. • The quality approach and company policy. • Regulatory changes.

4 – Expected results •

The information is correctly transmitted and understood by the technicians. • Facilitation or coaching meetings are conducted in an efficient and engage the team. • The objectives and developments are shared by all. • The reports are forwarded to the hierarchy.

5 – Autonomy

Task 5T2: contribute to training.

1 – Description of the task •

Participate in identifying the training needs of technicians • Plan, organize and carry out a training sequence on equipment or a equipment, a working method, a technology. • Set up rapid training to meet a specific need • Support newcomers to the company. • Participate in the reception and training of a trainee, an apprentice.

2 – Beginning situation • A need for training, planned or not, accompaniment, tutoring with a person or a group.

3 – Conditions of realization

3.1 – Means •

Communication tools • A room equipped with audio-visual and office equipment. • Educational kits, manufacturer's or supplier's documentation. • Company's or client's equipment. • Demonstration materials. • Workshop tools and equipment.

3.2 – Liaisons •

The people participating in the training. • The hierarchy and the various services of the company • The teachers or trainers of the trainee or the apprentice. • The tutor or the apprenticeship master. • The manufacturer or supplier.

3.3 – References and resources

• Technicians' skills assessments • Information provided by the manufacturer or suppliers. • Courses and training materials from the manufacturer or suppliers. • The internship agreement or the apprenticeship contract. • The training plan and the training follow-up booklet. • The company's quality approach.

4 – Expected results

• The training objective is clearly defined. • The contents and the training approach are adapted to the local context and to the audience.

• Answers related to questions from trained people are processed. • The knowledge transmitted and the professional skills acquired are assessed.

• A proposal for additional training is sent to the hierarchy if necessary.

5 – Autonomy

Activity A6 – Adaptation of materials

Task 6T1: analyze the need and write the specifications

1 – Description of the task • Collect the information provided by the client. • Analyze this information. • Identify functions. • Write the specifications.

2 – Initial situation • A need expressed by the client.

3 – Conditions of realization

3.1 – Means •

The good to be adapted or on which to adapt. • Technical documentation. • IT tools.

3.2 – Connections

• The client. •

The different departments of the company. • The manufacturer of the property to be adapted or on which to adapt. • Suppliers.

3.3 – References and resources • The technical files of the materials. • Standards and regulations in force.

4 – Expected results

• Specifications are proposed to the customer.

5 – Autonomy

Task 6T2: research, choose and propose a solution adapted to the customer's needs

1 – Description of the task • Look for well-argued solutions from a technical and economic point of view. • Calculate their cost. • Consult suppliers or outside companies. • Propose or choose a solution. • Develop the solution implementation file. • Propose a deadline. • Develop an estimate. • Inform the manufacturer of the planned modification in the form of a file of validation.

• Protect the proposed solution if necessary.

2 – Starting situation

• The specifications have been validated by the client.

3 – Conditions of realization

3.1 – Means •

The good to be adapted or on which to adapt. • Technical documentation • IT tools.

3.2 – Connections

• The different departments of the company. • The customer. • The builder of the asset. • Suppliers.

3.3 – References and resources

• The technical file of the good. • Technical and economic data. • The standards and regulations in force.

4 – Expected results

The solution is proposed to the customer in the form of a technical file, an estimate *and* a deadline.

The operating conditions of the equipment are defined.

5 – Autonomy

Task 6T3: ensure the follow-up of the realization and the provision to the customer

1 – Description of the task

• Prepare the consultation of suppliers or external companies and justify the choice of provider. • Schedule the implementation of the solution. • Ensure the follow-up of the realization. • Validate the achievement. • Prepare the use and maintenance file. • Prepare the passage of the solution in front of a certifying body if necessary.

2 – Initial situation • The solution has been accepted by the client.

3 – Conditions of realization

3.1 – Means •

The good to be adapted or on which to adapt. • Technical documentation • IT tools.

3.2 – Connections

• The client. • The different departments of the company. • The manufacturer of the property to be adapted or on which to adapt. • Suppliers.

3.3 – References and resources

• The technical file of the good. • Technical and economic data. • The standards and regulations in force.

4 – Expected results

• The solution is made available to the customer. • A user and maintenance manual is given to him.

5 – Autonomy

Activity A7 – Agro-technical advice

Task 7T1: Propose equipment relating to phytotechnical or zootechnical production

1 – Description of the task • Collect the information provided by the client. • Take into account the current economic and agro-environmental situation. • Propose technical itineraries for phytotechnical production. • Propose technical equipment solutions for zootechnical production.

2 – Initial situation • The client expresses a need.

3 – Conditions of realization

3.1 – Means •

Supplier catalogs and specialized magazines. • Technical documentation relating to equipment. • The informatic tool.

3.2 – Links • The customer or the user. • Other company departments. • The builders. • Technical institutes.

3.3 – References and resources

• The European market offer. • Standards and regulations relating to materials and the environment, conditions and constraints of plant and animal production.

• Test results from technical institutes.

4 – Expected results

• The proposal is tailored to the needs of the client in a development context durable and energy saving.

5 – Autonomy

Task 7T2: ensure the implementation of equipment

1 – Description of the task • Deliver the material in safety • Handle the materials in the rules of the art at work and in safety. • Present the functions of the equipment and its settings. • Train in the use of the equipment to obtain the best performance. • Identify and escalate technical problems with the machine to the manager factory product.

2 – Starting situation

• The customer does not know the equipment or is not trained in its use and its interview

3 – Conditions of realization

3.1 – Means • Possession of driving permits. • The equipment(s) made available. • Technical documentation. • Places of evolution.

3.2 – Links • The owner of the material. • Demonstration organizers, customers, prospects. • Owners of plots or buildings. • Other company departments. • The builders.

3.3 – References and resources

• Equipment use, adjustment and maintenance manuals. • Safety regulations.

4 – Expected results • The customer or prospect is informed about the functions and performance of the equipment. • The customer is trained in the use, adjustments and maintenance of the equipment.

5 – Autonomy

Task 7T3: propose solutions to reduce production costs in a sustainable development approach

1 – Description of the task

• Take stock of the client's current level of equipment. • Quantify the level of equipment required for the work to be performed. • Evaluate the conditions of use of the materials. • Evaluate the energy consumption and the environmental impact of the work made.

• Propose solutions to reduce production costs and impact environmental.

2 – Starting situation

• The customer wishes to reduce production costs in a process of sustainable development

3 – Conditions of realization

3.1 – Means •

Systems for recording practices and data. • The technical instructions for the equipment. • The informatic tool.

3.2 – Liaisons •

The client(s). • The dealer. • The constructor. • The meteorological service.

• The chambers of agriculture.

3.3 – References and resources • The results of trials and tests carried out by technical institutes or builders.

• the regulations and standards in force • Databases.

4– Expected results

• The advice given makes it possible to propose a technical itinerary to reduce operating costs and environmental impact.

5 – Autonomy

Activity A8 – Sale of complementary products, equipment or services.

Task 8T1: Participate in the development of additional sales support tools

1 – Description of the task

• Collect information. • Write nomenclatures and procedures. • Develop nomenclatures and procedures. • Write flat-rate additional sales assistance sheets.

2 – Starting situation

• The history of the situations experienced during the development phase of the tools. • Updating existing tools.

3 – Conditions of realization

3.1 – Means • IT tools **3.2 – Connections** • Sales department • Customers • Manufacturers and suppliers

3.3 – References and resources

• Manufacturer or supplier databases • Technical documentation • Parts databases • Labor times and scales

4 – Expected results

• Fixed forms are drawn up and updated.

5 – Autonomy

Task 8T2: Determine the need(s)

1 – Description of the task

• Listen and collect information provided by the client. • Question the client to determine his needs.

2 – Starting situation

• An offer of materials, equipment and services. • Customer expectations.

3 – Conditions of realization

3.1 – Means •

Manufacturers' documents. • Equipment.

• Supplier documents.

3.2 – Connections

• The customer

• The sales department **3.3 –**

References and resources

• Regulations in force • Sales support tools including the discovery plan. • Flat-rate sheets.

4 – Expected results

• Purchasing motivations and obstacles are identified. • Customer expectations have been translated into needs.

5 – Autonomy

Task 8T3: Research a service or sales solution

1 – Description of the task

- Look for solutions of services or products or equipment adapted to the needs
- Identify technical or economic elements to highlight the advantages of the solutions • Develop a commercial proposal

2 – Starting situation

- The identified needs of the client

3 – Conditions of realization

3.1 – Means •
Manufacturers' documents •
Equipment • Sales support tools
(informed discovery plan, flat-rate sheets)

3.2 –

Connections • The company's services • The customer

3.3 – References and resources •

Documentation and technical notes from manufacturers and suppliers • Services within the company • Standards and regulations in force **4 – Expected results** • The choice of solutions is adapted to the needs identified and makes it possible to prevent legal disputes and disputes.

- The development of the proposal is carried out with a view to building customer loyalty • The technical and economic elements of the proposal are mastered and relevant

5 – Autonomy

Task 8T4: Propose by arguing the service or sales solution

1 – Description of the task

• Propose in a reasoned way the solution from a technical point of view and/or economic • Respond to questions and convince the client • Reformulate the proposal if necessary • Inform the contract and inform on the legal aspects

2 – Starting situation

• The definition of the solution

3 – Conditions of realization

3.1 – Means • Manufacturers' documents • Equipment

3.2 – Connections • Company services

• Customer

3.3 – References and resources • Documentation and technical notes from manufacturers and suppliers • Services within the company • Standards and regulations in force • Sales support tools **4 – Expected results**

• The proposal is convincing and leads to the signing of the contract.

5 – Autonomy

ANNEX I b

CERTIFICATION STANDARD

SKILLS: Abilities / Skills / Tasks Relationships

Abilities	Skills		Tasks
			T1.1 T1.2 T1.3 T1.4 T1.5 T1.6 T2.1 T2.2 T2.3 T3.1 T3.2 T3.3 T3.4 T3.5 T4.1 T4.2 T4.3 T4.4 T5.1 T5.2 T6.1 T6.2 T6.3 T7.1 T7.2 T7.3 T8.1 T8.2 T8.3 T8.4
C1 **Communicate**	C1.1	Getting informed	
	C1.2	Listen to the customer, dialogue and negotiate a solution	
	C1.3	Present	
C2 **Analyze**	C2.1	Interpret data Analyze a	
	C2.2	maintenance or adaptation situation	
	C2.3	Analyze an agro-technical situation	
	C2.4	Analyze a legal, economic and managerial situation	
	C2.5	Analyze a technical system	
C3 **Propose**	C3.1	Look for or imagine solutions	
	C3.2	Choose a technical solution of equipment, methods or procedure	
	C3.3	Encrypt a solution	
C4 **Organize**	C4.1	Manage equipment and workstations	
	C4.2	Plan and manage operations	
C5 **Perform**	C5.1	Implement equipment, measurement or diagnostic tools, a procedure Develop a	
	C5.2	procedure, an after-sales service process	
	C5.3	Carry out tests, settings, apply procedures, control, validate, an	
	C5.4	intervention, a method, a procedure	
C6 **Prevent**	C6.1	Take into account the environmental impact of the company's activity	
	C6.2	Advising a client on the use of his equipment which respects the environment	
	C6.3	Define and implement occupational risk prevention measures	

C1: COMMUNICATE

C1.1. : Get informed

Context / Data	*Shares*	*Performance indicators*
Depending on the case : - A material - The customer - The results of measurements or tests - An intervention, an adjustment, a configuration or preparation of equipment - A need for equipment, adaptation or service - An equipment sale - The implementation of a material or a demonstration - All technical or commercial documentation media - The technical or commercial team of the company	**Collect** technical and commercial information and on the use of equipment, its settings and settings or the circumstances of a malfunction	The approaches implemented are adapted to research and efficient. The information found is relevant to the need. The information collected makes it possible to analyze the operating or malfunctioning conditions of a piece of equipment.

C1.2 Listen to the customer, dialogue and negotiate a solution

Context / Data	*Shares*	*Performance indicators*
Depending on the case : - Customer information (statutory and commercial identification data, history of the relationship) - Data from the company's commercial policy: prices, general conditions of sale, commercial objectives, etc. - Information on the characteristics of the offer: products and services, technologies, deadlines, etc. - Negotiation support tools and supports	**Identify** the customer's problem and identify their expectations, **identify** the constraints and opportunities relating to the context, **identify** the customer's motivations and obstacles. **Manage** the interpersonal relationship through appropriate communication. **Develop** and **propose** a solution, **argue** the chosen solution, **formalize** the solution in all its components (technical, commercial, financial) and **propose** the various alternatives.	Relevant information on the customer's commercial, technical and financial situation is identified and used in a logical order. Customer risk is assessed. A solution respecting the expectations of the client, in accordance with the commercial strategies and constraints of the company, is proposed in a contractual form.

C1. 3: Present

Context / Data	*Shares*	*Performance indicators*
Depending on the case : - A material - The customer - The results of measurements or tests - An intervention, an adjustment, a configuration or preparation of equipment - A need for equipment, adaptation or service - A sale of equipment, adaptation	**Complete, produce** and **present** documents in physical or digital form (repair order, estimate, forms, work monitoring, invoicing and workshop management media, commercial activity monitoring media, specifications, user manual, technical expertise report, note)	The document produced is written in a readable, structured and appropriate way for the recipient. It respects: - the company's objectives - the company's codes, - the standardizations

C2: ANALYZE

C2.1: Interpret data

Context / Data	*Shares*	*Performance Indicators* The
Depending on the case : - The history of the material and its equipment - Administrative reception documents - All documentation supports workshop technology. - Access to technical information from manufacturers and suppliers - Data from support tools and diagnostics, tests, etc. - Reports and interpretations of previous analyzes - Deadlines and human, technical, economic and legislative constraints	**Identify** available data, **sort** relevant data and **format** it in an intelligible way.	sorting of data is complete and sufficient for the task envisaged. The technical or economic context is taken into account. Formatting uses appropriate modeling tools.

C2.2: Analyze a technical maintenance or adaptation situation

Context / Data	*Shares*	***Performance indicators*** The
Depending on the case : - A set of data (specifications, equipment documentation, OR, interpreted data, commercial context, etc.) relating to : • a malfunctioning problem on material or equipment • material or equipment existing for which an adaptation is necessary • an intervention decision for which teamwork preparation is necessary - The necessary analysis tools (computerized or not) - Standards and regulations - Existing material or equipment in working or malfunctioning condition.	**Appropriate** the elements available, **extract** the elements necessary for the identification of phenomena or problems, **formulate** and **prioritize** hypotheses and **determine** avenues of investigation	information in the file is taken into account and understood. The elements extracted are appropriate to the situation. The possible consequences of the malfunction or adaptation on the whole system are taken into account. The assumptions made are correctly prioritized. The avenues of investigation are correlated with the hypotheses.

C2.3: Analyze an agro-technical situation

Context / Data	*Shares*	***Performance indicators*** The
- The customer's needs depending on the case: • desire to acquire new equipment • material or equipment partially meeting the needs • new situation requiring a global reflection on equipment. - The technical situation of exploitation: • technical itineraries • existing equipment • soils and plots • buildings and equipment • constraints of exploitation • economic context of exploitation. - Environmental standards and their regulatory applications. - Documentation relating to materials, supplies and supplies. - Test results.	**Make** an inventory of the client's situation **List** the advantages and disadvantages of a particular technique **Compare** different techniques **Quantify** the elements necessary to guide the decision	inventory of the customer's situation is carried out: correlation of needs/ equipment level. The current technical itineraries are inventoried and compared from the point of view: • *agronomic or zootechnical* • economic • *impact on the environment* • *time* saving • *energy saving* Opportunities to change current practices are quantified and proposed.

C2.4: Analyze a legal, economic and managerial situation

Context / Data	*Shares*	*Performance indicators*
- The customer's request (needs, projects). - The offer: the equipment or services (characteristics, options, purchase cost and cost of services, etc.) - The legal profile and the economic situation of the client • Statutory and quantified data • History • Forecasts • Financing - The commercial policy of the supplier and the company - Regulations	**Identify** the customer **Collect, select** and **classify** the legal and economic technical data of the potential market. **Analyze** data **Evaluate** proposals tailored to demand and supply, in accordance with regulatory requirements	The legal and economic status is clearly explained The data collected is complete, ordered and consistent. Evaluation of proposals is consistent with supply, demand, company and supplier business strategy and regulatory requirements.

C2.5: Analyze a technical system

Context / Data	*Shares*	*Performance indicators*
- A set of interpreted data relating to: • a malfunctioning problem on material or equipment • existing material or equipment for which an adaptation is necessary • an intervention decision for which a preparation of teamwork is necessary - A set of technical data (plans, diagrams, etc.) - The technical notes of the builders - The necessary analysis tools (computerized or not) - the standards and regulations - the material or equipment existing in working or malfunctioning condition	**Perform** functional, structural and behavioral analysis of all or part of a system to **model** all or part of it, **identify** areas of limited reliability and determine the parameters to be checked or measured.	- The functional and structural analysis of the system is perfectly carried out: • brand, type and version of components (computers, software, etc.) • study boundary • global function • input, output and control data are identified. - Information and energy chains are described. - The behavior of the system is specified correctly. - Modeling is conforms and respects standards and conventions. - Areas with limited reliability are spotted. - Parameters are clearly identified.

C3: PROPOSE

C3.1: Look for or imagine solutions

Context / Data	*Shares*	*Performance indicators*
According to the case : - The customer. - The company, its personnel and its services. - Manufacturers, suppliers, subcontractors and their databases. - The specifications or the repair order. - The material or equipment of the customer, its technical documentation and the conditions of use. - Technical, commercial and regulatory documentation	**Research** or **imagine** informed technical solutions (technical, agronomic, economic, use data), materials or equipment, an intervention method or procedure, solutions (material or use) to reduce production costs, service or sales solutions in compliance with the regulatory framework	- The proposed solutions are consistent, informed and meet the specifications. - They take into account the sustainable development approach. According to the case : - They take into account the necessary and available equipment. - They are clear and adapted to the speaker. - They take into account customer loyalty

C3.2: Choose a technical solution of equipment, methods or procedure

Context / Data	*Shares*	*Performance indicators*
Depending on the case – Different solutions meeting customer specifications. – The corresponding files and the documentation needed. - The customer. – The customer's material or equipment. – Company policy and constraints. – The technical, agronomic and economic specifications. – A phyto-technical or zootechnical production	**Compare** different proposals for technical solutions, materials and equipment, reduction of production, service or sales costs and **justify** the choice of the chosen proposal.	– The proposals are clearly presented and classified. – The comparison of different proposals include the appropriate criteria, which is argued. – The arguments are used in a reasoned, constructed, clear and appropriate way. It relates the proposal to the specifications. – The proposed solution is accepted.

C3.3: Encrypt a solution

Context / Data	*Shares*	*Performance indicators*
From : - One or more solutions adopted - Relevant and necessary documents. - Possibilities of financing the customer - Prospects of evolution planned by the client - From the policy and the constraints of the company. - Specifications, agronomic, technical and economic	**Identify** the elements of the estimate **Calculate** the different loads generated by the possible choice(s). **Write** a quote	- The elements of the estimate are correctly identified. - The estimate is presented in such a way as to highlight the most representative criteria of the specifications. - Costs are accurately calculated and clearly presented.

C4: Organize

C4.1: Manage equipment and workstations

Context / Data - The	*Shares*	*Evaluation indicators* -
workshop, fixed equipment, maintenance and diagnostic equipment - Workshop personnel and their qualifications. - The spare parts department or the manufacturer. - The estimate and the details of the intervention. - The operating mode linked to each workshop equipment (number of people required, duration of typical interventions, etc.) - Workshop planning (technicians, equipment and tools, etc.) - Technical documentation manufacturer, equipment and tools. - the costs of use and workshop equipment maintenance - Regulatory texts concerning the protection of the environment, recycling, health and safety	**Define** the intervention areas, **organize** the workstations, **participate** in the technological development of the workshop, **ensure** the follow-up of the maintenance for the tools and the equipment, the follow-up of the controls provided for by the regulations	The choice takes into account the availability of equipment and technicians. - The organization of the workstation is consistent with the repair order and complies with the procedures. - Hygiene, safety and environmental rules are respected - Tools and equipment are identified, updated, compliant and stored - The organization of the workshop and equipment respects the company's quality approach. - Maintenance of certification (if it exists) or of the desired level. - The upgrade proposals are relevant. - The proposals of new tools and equipment meet a real business need. - Regulatory controls are carried out.

C4.2: Plan and manage operations

Context / Data	*Shares*	*Evaluation indicators*
- Repair orders. - Equipment history. - The workshop schedule with its load plan for work in progress. - The availability of parts and tools. - Customers, their equipment and their needs. - the human and material means of intervention - Technical support for builders or the company. - Intervention scales. - The technical and/or economic objectives.	**Organize** and **plan** the activities of the workshop taking into account the hazards in order to meet deadlines, **monitor** and **control** the interventions in Classes	- The load plan is coherent and optimized. It incorporates all the constraints of human skills, material availability, deadlines, health and safety rules - The load plan is capable of adapting to any contingencies (for example late delivery, random entries, technical remedial repairs). - Health, safety and environmental rules are respected - Supply delays and constraints are taken into account and managed - Defects noted during the intervention are taken into account, the customer is informed and corrective actions are taken accepted.

C5: Realize

C5.1 - Implement equipment, measurement or diagnostic tools, a procedure

Context / Data	*Shares*	*Evaluation indicators*
- Equipment and accessories - The repair order - Measuring tools - Diagnostic tools - Technical and user manuals. - The objective of the implementation - The places of evolution of the material - Information on the public concerned.	**Define** the conditions of implementation, **prepare, choose, implement** the materials, tools or procedures in complete safety.	- The safety rules are identified, the conditions of implementation are listed, the public concerned is identified. - The material is prepared for use in optimal conditions. The choice of tools is appropriate to the expectation. The implementation of equipment, measurement and diagnostic tools, procedures is carried out under the conditions provided.

C5.2 - Develop a procedure, an after-sales service process

Context / Data	*Shares*	*Evaluation indicators*
– The specifications – The equipment and its accessories – The technical notices – The objective of the procedure – The information necessary for the development of the procedure – Information on the public concerned. – Standards and regulations – Internal procedures	**Identify** the elements necessary for the development of the procedure or process, **define** the chronology of operations, **format** and **present** the elements of the procedure.	- Items are listed precisely and in line with expectation. - Standards and regulations are taken into account - The scheduling of operations is clear, logical and coherent. - The choice of communication medium is relevant. - The choice of elements is relevant and adapted, presented and transcribed in accordance with the expectations of the target audience.

C5.3 - Carry out tests, settings, apply procedures,

Context / Data	*Shares*	*Assessment indicators* -
– The equipment and its accessories – The repair order – The implementation file – Technical and user manuals – Measuring tools and tools for diagnostic – User manuals – Control procedures	**Carry** out tests, measurements, settings, adjustments necessary to **establish** a diagnosis or another operation	The tests, measurements and settings are carried out in accordance with the requirements (protocol) - The procedures are respected. - The approach is rigorous and logical.

C5.4 - Control, validate, an intervention, a method, a procedure

Context / Data – The	*Shares*	*Evaluation indicators* -
equipment and its accessories, in working order or in malfunction. – reference data technical and economic – The elements of intervention, adaptation. – Procedure files – Test reports – Dashboards	**Check** the execution of the different steps, **measure, interpret** the differences between reference values and actual values, **validate** the solutions	The chronological order and the stages are respected in the necessary health and safety conditions - The results are consistent with the situation. Abnormalities are reported. - The validation criteria are identified. - The checks made it possible to qualify the solutions.

C6: Prevent

C6.1: Take into account the environmental impact of the company's activity

Context / Data	***Shares***	***Evaluation indicators*** -
- The regulations in force relating to the environment - Workshop activities. - The equipment present in the company. - The customer. - The company and its policy. - External partners, (for example control or advisory bodies, recycling companies).	**Apply** the company's policy integrating the regulations in force, **implement** the procedures and the means of protection or prevention, **evaluate** their effectiveness, **propose** improvements if necessary.	Company policy is known and applied. - Procedures and means are correctly implemented artwork. - The evaluation, the proposals are relevant.

C6.2: Advise a customer on the use of his equipment that respects the environment

Context / Data - Current	***Shares***	***Evaluation indicators***
regulations relating to the environment. - The customer, his equipment and a situation of use. - Phytotechnical or zootechnical production. - The company and its policy. - External partners, (for example control or advisory bodies, recycling companies).	**Identify** the risks and impacts related to non-respect of the environment, **recommend** solutions and appropriate uses, **verify** the proper implementation of the recommendations	- The main risks and environmental impacts are taken into account. - The recommendations are clearly defined and checked where necessary. - Implementation costs are estimated.

C6.3: Define and implement occupational risk prevention measures

Context / Data - General	***Shares***	***Evaluation indicators*** o
principles of prevention, references to current laws and decrees - Operators, their qualifications and authorizations and authorisations. - A work situation within the company or outside. - Information on: - dangerous phenomena and products. - the consequences of exposure to risks. - Regulatory texts, standards and information for personnel. - INRS information sheets and of the CARSAT - The single document. - Safety data sheets for hazardous products - Job descriptions	**Identify** regulations and legislation relating - to activities - to the use of means and products - to the protection of personnel in terms of their safety **Identify** and **assess** the occupational risks related to a work situation, **Propose and implement** prevention and protection measures in a process of eliminating or reducing risks allowing the operator to work in safety and preserve his health while respecting his human and material environment	Occupational risks are identified from the design of work situations. o The level of risk is defined in severity and frequency. o The measures implemented work make it possible to eliminate or reduce the risks without generating new ones: o for the operator o with respect to the human environment o with respect to the material environment o After intervention, the materials are in

- Labeling of dangerous consumable products (codification) - Protective equipment and its use. - The intervention procedures - The equipment manufacturer's instructions - The periodic inspection and verification reports - External partners (for example, occupational medicine, inspection or advisory bodies). - Accident or incident reports	**Evaluate** and **maintain** the effectiveness of the means put in place artwork.	compliance o Procedures of intervention are adapted to the measures taken for the prevention of occupational risks. o The single document is updated.

ASSOCIATED KNOWLEDGE

The knowledge is organized around ten distinct themes :

S1: General culture and expression

S2: English

S3: Mathematics

S4: Physical and chemical sciences o Errors and uncertainties o Fluid mechanics o Mechanical waves o Signal analysis o Linear systems o Control and regulation o Signal processing o Distribution of electrical energy o Energy o Chemistry: chemical reaction o Chemistry: redox o Thermodynamics

S5: Knowledge from the agrotechnical point of view of the customer environment of agricultural equipment 1. S5.1- Plant production 2. S5.2 - Animal production 3. S5.3 - Agro-environmental measures 4. S5.4 - Knowledge of manufacturer products

S6: Professional Methodology in Industrial Technology
o S6.1 - Functional, structural and behavioral analysis tools o S6.2 - Diagnostic methodology o S6.3 - Maintenance strategy o S6.4 - Implementation methodology o S6.5 - Organization and monitoring of 'a project

S7: Industrial technologies 5.
S7.1 - Energy converters **6.** S7.2 - Energy storage **7.** S7.3 - Energy use **8.** S7.4 - Comfort- Help to conduct **9.** S7.5 - Acquisition, transmission and processing of information

S8: Professional methodology in economics-management
10. S8.1 - The company
11. S8.2 - The legal framework of the company's activities
12. S8.3 - Communication and negotiation

S9: Occupational health and safety, ergonomics 13. S9.1 - Occupational health and safety issues 14. S9.2 - Knowledge of the main risks 15. S9.3 - Prevention approaches.
16. S9.4 - Safety, regulations

S10: Environmental protection
17. S10.1 - Sustainable development
18. S10.2 - Environmental management 19.
S10.3 - Waste collection, sorting and disposal

For the themes relating to knowledge S5 to S10 are defined:
– the associated knowledge (left part); – the levels of
acquisition and mastery of this knowledge expected of the holder of the Technical and Services BTS in Agricultural Equipment.

These levels of knowledge acquisition and mastery are specified below.

Specification of levels of acquisition and mastery of knowledge

	Indicator of level of acquisition and mastery of knowledge	LEVEL 1 2 3 4
Knowledge is relative to the apprehension of an overview of a subject; the realities are shown under certain aspects in a partial or global way.	Information level	
Knowledge is relative to the acquisition of means of expression and communication: defining, using the terms that make up the discipline. It is about mastering knowledge. This level encompasses the previous one.	Expression level	
Knowledge relates to the mastery of study or action processes and tools: using, manipulating rules or sets of rules (algorithm), principles, with a view to achieving a result. It is about mastering a skill. This level includes, in fact, the two previous levels.	Tool proficiency level	
Knowledge relates to the mastery of a methodology for posing and solving problems: assembling, organizing the elements of a subject, identifying relationships, reasoning based on these relationships, deciding with a view to a goal to be achieved. It is a question of mastering an approach: inducing, deducing, experimenting, documenting oneself. This level actually encompasses the three previous levels.	Level of methodological mastery	

S1. General culture and expression

The teaching of French in the sections of higher technicians refers to the provisions of the decree of January 17, 2005 (BOEN n ° 7 of February 17, 2005) fixing the objectives, the contents of the teaching and the reference of capacities of the field general culture and expression for the higher technician certificate.

S2. English

The teaching of English in the sections of higher technicians refers to the provisions of the decree of July 22, 2008 (BOESR n ° 32 of August 28, 2008) fixing the objectives, the contents of the teaching and the reference of capacities in the field of English for the higher technician certificate.

S 3. Mathematics

The teaching of mathematics in the sections of higher technicians "Techniques and services in agricultural equipment" refers to the provisions of the decree of XXX fixing the objectives, the contents of the teaching and the reference of the capacities of the field of mathematics for the higher technician certificates.

I - Guidelines

2. Section Specific Objectives

The study of continuous phenomena resulting from the physical sciences and technology constitutes one of the essential objectives of the training of senior technicians in “Techniques and services in agricultural equipment”. They are described mathematically by functions obtained, most often, as solutions of differential equations.

Similarly , *knowledge of some statistical methods* used to control the quality of equipment and assess its lifespan is essential for a senior technician in “Techniques and services in agricultural equipment”.

3. Content organization

It is according to these objectives that the teaching of mathematics is designed; it can be organized around *four poles :*

– a study of the *usual functions,* that is to say exponential, powers and logarithms, the mastery of which is necessary at this level;

– solving linear *differential* equations involved in electricity and mechanics;

– an introduction to the *calculation of probabilities,* followed by notions of *inferential statistics* leading to the construction of the simplest statistical tests used in quality control;

– an appreciation of *the numerical and graphic aspects* for the whole program, an introduction to some elementary methods of *numerical analysis* and the use of the appropriate *IT resources* for this purpose : programmable calculator with graphic screen, computer equipped with a spreadsheet , computer algebra, geometry or application software (modeling, simulation, etc.).

II - Program

The mathematics program consists of the following modules:

Functions of a real variable, with the exception of the paragraphs " *Local approximation of a function* " and " *Parameterized curves* ".

Integral calculation, with the exception of the " *Formula for integration by parts* " paragraph.

Differential equations.

Descriptive statistics.

Probabilities 1.

Probabilities 2, with the exception of the paragraph " *Examples of random processes* ". Care is taken to introduce the vocabulary of reliability.

Inferential statistics.

Vector calculation.

S4. Physical and Chemical Sciences

o **Preamble**

The teaching of physics and chemistry in STS **Techniques and Services in Agricultural Equipment** is based on the scientific training acquired in the second cycle. It aims to reinforce the mastery of the scientific approach in order to give the student the autonomy necessary to carry out the professional tasks which will be proposed to him in his future profession and to act as a responsible citizen. This course aims to acquire or strengthen future senior technicians' knowledge of physical models and the ability to use them in the context of their professional practice. It must enable him to cope with the technological developments that he will encounter in his career and be part of lifelong training.

The skills specific to the scientific approach must allow the student to make informed decisions and to act independently and appropriately. These skills require the mastery of capacities that go far beyond the framework of scientific activity:

1. compare their representations with reality;
2. observe with curiosity; mobilize their knowledge,
3. research, extract and organize the useful information provided by a situation, experience or document;
4. reason, demonstrate, argue, exercise analytical skills.

The physics-chemistry program is organized in two parts:

- o in the first part are described the skills that the practice of the **experimental approach** allows to develop. These skills and the associated abilities will be exercised and implemented in a variety of situations throughout the two years based on the areas studied described in the second part of the program. Their acquisition must therefore be subject to long-term planning and monitoring;

- o in the second part are described **the knowledge and** skills skills which are organized in two columns: the first column "notions and contents" corresponds to one or more "required skills" of the second column. It thus highlights the key elements constituting the base of knowledge and skills, the assimilation of which by all students is required.

The program indicates the training objectives to be achieved for all students. It does not in any way represent an imposed progression. The teacher must organize his teaching by respecting four main guiding principles:

– Putting students into activity: the acquisition of knowledge and skills will be all the more effective if the students have effectively implemented these skills. The experimental approach and the documentary approach allow this activity. The teacher can implement other activities along the same lines;

– putting knowledge and skills into context: scientific questioning, a prelude to the construction of notions and concepts, will be deployed using technological objects, simple or complex processes, within the professional domain of the section. To deliver his teaching, the professor relies on professional practice. Consequently, lessons should be contextualized using examples taken from the list of **business applications** offered in this repository. The aim will be to develop its uses in various professional fields and take into account the needs and constraints of the professional agricultural equipment sector.

– an adaptation to the needs of the students: a certain number of the required capacities of the program come from the high school programs and are therefore already mastered by the students. The progression must therefore take into account the students' achievements; – a necessary alignment of the various scientific and technological courses: progress in physics and chemistry must be articulated with those implemented in the courses of mathematics and science and industrial techniques.

The teacher may be required to present notions in relation to student projects or their internships, notions that are not explicitly included in the program. These situations are an opportunity for students to mobilize the skills targeted by the training in a new context and to reinforce their mastery. The additional knowledge thus acquired is not required for the examination.

The experimental approach

The experimental activities implemented within the framework of a scientific approach mobilize the skills listed in the table below. Associated capacities are explained in order to specify the contours of each skill: they do not constitute an exhaustive list and can sometimes relate to several areas of skill.

The skills must be acquired at the end of the STS training, the level of requirement being naturally to be put into perspective with that of the other components of the program of the sector concerned. They need to be regularly mobilized by the students and are evaluated based, for example, on the use of evaluation grids. This therefore requires planning and monitoring over time.

The order of presentation of these does not prejudge an order of mobilization of these skills during a session or a sequence.

Skills	Abilities (non-exhaustive list)
Appropriate	- Understand the problem of the work to be carried out. - Adopt a critical attitude towards information. - Search, extract and organize information related to the problem. - Know the vocabulary, symbols and units used in artwork.
Analyze	- Choose an experimental protocol/device. - Represent or complete a diagram of an experimental device. - Formulate a hypothesis. - Propose a strategy to solve the problem. - Mobilize knowledge in the disciplinary field - Organize the
Achieve	workstation - Adjust the equipment/device chosen or made available - Implement an experimental protocol. - Perform experimental readings - Handle with confidence in compliance with safety rules. - Know the equipment, its operation and its limits - Criticize
To validate	a result, a protocol or a measurement. - Exploit and interpret observations, measurements. - Validate or invalidate information, a hypothesis, a property, a law … - Use the appropriate symbols and units. - Analyze results critically.
To communicate	- Report observations and results of the work carried out - Present, formulate a conclusion. - Explain, represent, argue, comment.

Be independent, demonstrate of initiative	- Develop an approach and make choices. - Organize your work - Deal with any incidents encountered

Concerning the " **Communicate** " skill, writing a written report is one of the training objectives. The experimental activities are also an opportunity to work on oral expression during a situation report or a final synthesis. The aim is to continue preparing STS students for the presentation of work and projects that they will have to conduct and exhibit during their training and, more generally, in the context of their profession. The use of a laboratory notebook, in the broad sense of the term including, for example, digital, can be an effective learning tool.

Concerning the ability skill " **Be autonomous, show initiative** ", it is cross-cutting in nature and contributes to the definition of the level of mastery of the other skills. The use of activities based on open questions is particularly suitable for training pupils in autonomy and initiative.

o **Errors and uncertainties**

To practice an autonomous and reasoned experimental approach, students must have knowledge and skills in the field of measurements and uncertainties: these intervene both upstream at the time of the analysis of the protocol, the choice of measuring instruments, etc. , and downstream during the validation and critical analysis of the results obtained. The notions explained below are those addressed in the final cycle programs of the S, STI2D and STL streams of the high school.

The capacities required must be mastered by the senior technician in **"agricultural equipment".**

Errors and uncertainties	
Concepts and contents	**Required capacities**
Errors and notions associated	- Identify the different sources of error (limits to precision) during a measurement: variability of the phenomenon and of the act of measurement (factors linked to the operator, to the instruments, etc.).
Uncertainties and notions associated	- Evaluate the uncertainties associated with each source of error. - Compare the weight of the different error sources - Evaluate the repeatability uncertainty using an evaluation formula provided. - Evaluate the uncertainty of a single measurement obtained using a measuring instrument. measure. - Evaluate, using a formula provided, the uncertainty of a measurement obtained when performing a protocol involving several sources of error.
Expression and acceptability of the result	- Master the use of significant figures and scientific writing. Associate uncertainty to this writing. - Express the result of a measurement operation by a value from possibly a mean, and a measurement uncertainty associated with a level of confidence. - Assess relative accuracy. - Determine the measures to keep according to a given criterion. - Comment on the result of a measurement operation by comparing it to a reference value. - Make suggestions to improve the process.

Knowledge and skills

Fluid mechanics - Fluid statics	
Concepts and contents	**Required capacities**
Pressure in a fluid	- Express the pressure as a surface force.
Fundamental principle of hydrostatics	- Exploit the fundamental principle of hydrostatics to calculate a pressure difference, fluid height or density. - Exploit the principle of pressure transmission by a fluid incompressible (Pascal's theorem) from concrete systems.
Fluid mechanics - Dynamics of incompressible fluids	
Concepts and contents	**Required capacities**
Mass flow and volume flow	- Calculate a mass or volume flow.
Continuity equation (or flow conservation)	- Exploit the conservation of mass (continuity equation) during a permanent flow in order to determine the speed of the fluid.
Preservation of energy (Bernoulli's theorem)	- Exploit Bernoulli's theorem for a permanent flow of a fluid perfect (with or without hydraulic machine, with or without head losses), Bernoulli's equation in the form of pressures or heights being given.
Viscosity	- List the importance of the phenomenon of viscosity in flows. - Identify the nature of the flow, the expression of the Reynolds number being given: existence of turbulent and laminar regimes.
Head loss in laminar regime	- List the different types of head loss. - Use data to determine the value of pressure drops in depending on the flow rate and the geometry of the circuit. - Determine a volume flow for a laminar flow as a function of the pressure difference, Poiseuille's law being provided.

mechanical waves	
Concepts and contents	**Required capacities**
1. Oscillations, resonance	
Response of a mechanical oscillator to an excitation;	- Associate a vibration with the dynamic behavior of a mechanical oscillator. - Identify the vibration magnitude(s). - Implement an experimental protocol to record vibrations. - Identify the sources of vibrations in the professional field and situate them on a frequency or amplitude scale.
Free oscillations or forced, amortization.	- Distinguish free oscillations from forced oscillations. - Distinguish between periodic, pseudoperiodic and aperiodic regimes. - Use a recording to determine the characteristics of a free or forced oscillation. - Experimentally verify the effect of damping on the amplitude of a vibration. - Characterize a forced oscillation by its frequency and its amplitude.
Resonance	- Identify the phenomenon of mechanical resonance. - Experimentally determine the conditions of mechanical resonance and measure the natural period of the resonator. - List some applications of the phenomenon of resonance in the case where it is sought and in the case where its effects are harmful to the behavior of a system.
2. Acoustic waves	
Acoustic waves: propagation, associated physical quantities (acoustic pressure (or overpressure), amplitude, frequency, speed).	- Describe the phenomenon of propagation of an acoustic wave from the associated vibration quantities (sound pressure and vibration speed) - Characterize an acoustic wave by the associated physical quantities: acoustic pressure, amplitude of acoustic pressure, frequency, wavelength, speed. - Know and exploit the relation between the wavelength, the frequency and the speed of an acoustic wave - Compare the order of magnitude of the speed of an acoustic wave in a few media: air, water, materials used in the professional domain.
Sound waves: energy aspects. Sound pressure and intensity levels.	- Set sound power, sound intensity. - Exploit the relationship between the acoustic intensity and the acoustic power of a source in the case of propagation in a direct field. - Measure a sound pressure level. - Define the acoustic intensity level and give the corresponding unit. Locate, on a scale of acoustic intensity levels, characteristic sounds (everyday life and professional field).

Perception of a sound. Normalized noises. Acoustic protection: dB and dBA sensitivity, standards and personal protective equipment (PPE).	- Identify the parameters that influence the sensory perception of a sound: frequency and intensity. - Analyze the perception of a sound and apply weightings. Explain the interest of measuring levels in dBA. - Use the standards relating to noise pollution to choose suitable protection (everyday life and professional field). For example, the characteristics of a sound level meter will be used to determine an uncertainty in a measurement result.
Reflection, transmission, absorption of an acoustic wave.	- Experimentally highlight the phenomena of reflection, transmission or absorption of an acoustic wave.

Signal analysis

Concepts and contents	**Required capacities**
Temporal properties	- Use a chronogram to determine the characteristics of a signal: average value, extreme values, final value, rise time, settling time. - Calculate, in simple cases, the average value of a signal from its chronogram. - State that a periodic signal can be considered as the sum of a DC component and an AC component. - Experimentally determine the characteristics of a signal
Frequency properties - State	that an alternating periodic signal can be decomposed into the sum of a fundamental and harmonics. - Exploit an amplitude spectrum. - Plot a signal's amplitude spectrum, frequency and amplitude of its fundamental and its harmonics being given. - Record the amplitude spectrum of a periodic signal.
Energy properties - State the	definition (energy aspect) of the effective value. - Calculate the effective value of a sinusoidal signal. - Measure the effective value of a periodic signal.

Linear systems

Concepts and contents	**Required capacities**
Transitional regime Steady state	- Locate the transient regime and the permanent regime on the response of a linear system - Identify the response of a linear system
Order of a system	- Identifying the order of a system from its step response - Using the step response of a first-order linear system to determine its time constant - Using the step response of a second-order linear system to determine its transmittance static and its response time at 5%.

	- Highlight the influence of the damping coefficient on the speed of the step response of a second-order linear system

Servicing and regulation	
Concepts and contents	**Required capacities**
Functional diagram of a controlled or regulated system.	- Use the functional diagram of a control or servo loop to identify its constituent elements - State the interest of a control or regulation.

Signal processing – Sensors and Measurement chain	
Concepts and contents	**Required capacities**
Measurement chains	- Experimentally implement simple measurement chains in relationship with business applications
Passive and active sensors	- Locate the sensor on a measuring chain. - Determine the input and output quantities. - Specify the nature of the output quantity of a sensor. - Explain the role of a sensor.
Static and dynamic characteristics	- Justify the choice of a sensor. - Exploit the static and dynamic characteristics of sensors. - Record the static and dynamic characteristics of a sensor.
Principle of operation of some sensors	- Associate the laws of physics or chemistry with the transducers present in the main sensors used in the professional field by exploiting resources.
Conditioning a sensor	- Explain, in a particular application, the role of a conditioner sensor. - Experimentally implement a set {sensor, conditioner} to determine its static characteristic (this set can be integrated). - Choose by exploiting resources a conditioning mode of a sensor for a given use.
Analog digital conversion	- Use the output/input characteristic of a DAC (digital-analog converter) and technical documentation to determine the characteristics of a DAC: resolution, non-linearity, conversion time.
Conversion	- Use the output/input characteristic of a CAN (converter analog-digital) and technical documentation to determine the

analog digital	characteristics of an ADC: resolution, non-linearity, conversion time. - Justify the role of a blocker sampler.

Distribution of electrical energy	
Concepts and contents	**Required capacities**
Distribution network - Describe	the electrical energy distribution network. Role of transformer.
Voltages and currents balanced three-phase	- Characterize a three-phase distribution: phase, neutral, phase-to-phase voltages, phase-to-phase voltages.
Electrical Safety	- Identify situations where there is a risk of electrocution. - List the characteristics of the TT type earth connection system in specifying the role of the earth conductor. - Know the different voltage ranges (TBT, BT and HT) continuously and alternatively.
Energy	
Concepts and contents	**Required capacities**
Relationship between power and energy	- Express the relationship between power and energy, use it in different contexts.
Energy balance Yield Energetic efficiency	- Represent the energy chain of different systems. - Determine yield. - Determine the energy efficiency of a machine

Chemistry: the chemical reaction	
Concepts and contents	**Required capacities**
1. The chemical reaction	
Atomic and molecular molar masses: M (g.mol^{-1}) The amount of material. Its unit: the mole.	- Calculate a molecular molar mass from the molar masses atomic - Knowing and using the different relationships to calculate a quantity of matter
Chemical reaction: symbolic writing, limiting reactant, stoichiometry, advancement, mass balance	- Write the equation of the chemical reaction with stoichiometric numbers correct - Carry out a material balance - Identify the limiting reactant. Define the notion of stoichiometric mixture - Study experimentally the evolution of a system hosting a reaction chemical
2. Case of combustions	
Combustion; fuels; oxidizers Complete and incomplete combustion Composition of common fuels and alternative	- Write the chemical equations of fuel combustion reactions (hydrocarbons) - Extract and exploit information on alternative fuels (composition, mode of operation, etc.) - Compare CO2 emissions
Energy aspects associated with combustion; orders of magnitude Calorific value of a fuel Octane and cetane	- Show experimentally that, during combustion, the system transfers energy to the external environment in thermal form and estimate the value of this energy released - Evaluate, using a formula provided, the energy released during combustion (enthalpy variation at constant pressure) - Define and compare the calorific values of some fuels - Collect and use information on octane and cetane numbers
pollutants Protection against risks of combustion	- Analyze toxicological data sheets to understand the physiological effects pollutants - Extract and use information on the dangers associated with combustion and means of prevention and protection.

Chemistry: Redox	
Concepts and contents	**Required capacities**
Oxidizer, reducer Oxidizing/ reducing couple Redox reaction	- Recognize an oxidation-reduction chemical reaction. - Identify the oxidant, the reducer, the oxidant/reducer couples involved. - Write the chemical equation of a redox reaction, the oxidant/reducer couples being given. Experimentally establish an electrochemical classification of metals.
Electrochemical cell Accumulator (electrolysis)	- Make an electrochemical cell and interpret its operation. - Use the Nernst relation to calculate the emf of a stack. - Distinguish between batteries and accumulators. - Interpret how a fuel cell works.
Corrosion of metals	- Extract and exploit information on the corrosion of metals and the protection methods used in the professional field (painting, chrome plating, anodizing, sacrificial anode, etc.).

Thermodynamics: Fundamentals	
Concepts and contents	**Required capacities**
Vocabulary and definitions (system, state of equilibrium, state variables, various types of transformations, intensive quantities, extensive quantities, state function). Internal energy U of a system. ÿU = W + Q.	- Interpret temperature as a measure of particle agitation. - Interpret the pressure of a gas as resulting from the elastic shocks of the particles on the walls. - Recognize the intensive or extensive nature of a quantity. - Interpret the notion of work during a transformation of a system based on the interactions between the constituent particles of this system.
Case of ideal gases	- Associate the energy of an ideal gas with the thermal agitation of the molecules component. - Exploit the ideal gas law - Use Joule's first law to determine the internal energy of a gas perfect. - Calculate the variation of internal energy for an ideal gas, the initial and final temperatures being known. - Calculate the work and the variation of internal energy in the case of adiabatic, isochoric, isothermal and isobaric transformations.
Enthalpy: Definition, interest Enthalpy of change of state.	- Establish an energy balance to determine an equilibrium temperature during a change of state - Implement an experimental protocol to determine an energy of change of state.

(latent heat of change of state)	
Statement of the second principle Simple examples of entropy variations	- Interpret the second principle as a principle of evolution making it possible to translate the irreversibility of thermodynamic transformations. (impossibility of spontaneous heat transfer from a cold source to a hot source). - Identify causes of irreversibilities - Calculate the variation of entropy exchanged during an isothermal transformation with thermostat at Text from the expression dSe= ÿQ/Text - Calculate the variations of entropy for reversible transformations simple in the case of condensed phases and in the case of an ideal gas.

Thermodynamics: heat transfers

Concepts and contents	**Required capacities**
Transfer methods thermal Calorimetry	- Describe qualitatively the three modes of heat transfer (conduction/diffusion, convection, radiation) by evoking the microscopic causes of heat transfer. - Predict the direction of a heat transfer between two systems in cases concrete.
Thermal characteristics of materials. Diffusion equation Energy exchanged by heat transfer in steady state Heat flux and thermal resistance.	- Define the heat flow, know how to use the appropriate units. - Calculate the thermal flux through a flat wall made of a homogeneous material, the expression or the value of the thermal resistance being given. - Experimentally compare the thermal conductivities of a few materials. - Define, in a one-dimensional situation, the heat flux density and specify its unit - Associate resistances or thermal conductances to determine the heat flow through a wall. - Determine the overall thermal resistance of a wall of a system made of different materials - Distinguish the permanent mode from the variable mode according to time (transient and periodic) - Carry out experimentally the heat balance of an enclosure in regime stationary - Experimentally determine the heat flux exchanged by fluids in a liquid-liquid heat exchanger and evaluate the overall heat exchange coefficient from experimental data. - Classify materials according to their insulating properties, their conductivity thermal given
Definition of convection Examples of treatment of	- Distinguish and compare conduction and convection (forced, natural) - Quantitatively determine the heat flow resulting from a convection phenomenon from the convection coefficients of a wall.

convective transfers	
Thermodynamics: thermal machines	
Concepts and contents	**Required capacities**
Application of the first principle and the second principle to dithermal cyclic thermal machines Yield, efficiency, Carnot's theorem. Examples of treatments thermodynamics of thermal machines	- Describe the principle of operation of motors and machines refrigerants and identify the energy transfers involved in carrying out an energy balance. - Identify the change in enthalpy at work for one cycle of a compressor operating adiabatically. - On an example of your choice, construct an entropic diagram (T,S) and use it to calculate the energy exchanges. - Use the Clausius-Carnot inequality and illustrate the operating domains of machines using the Raveau diagram. Establish the theoretical yield of a - Carnot cycle of an ideal gas. - Define, express the output or efficiency of a dithermal thermal machine and give the maximum coefficients of performance for reversible operations. - Distinguish efficiency and coefficient of performance of a thermal machine for which these quantities are defined (heat pump, etc.). - Use information (simulation, text, graphics, ...) to describe a real machine of your choice, emphasizing the modeling of transformations. - Identify on examples of the causes of irreversibilities and give the consequences on the coefficient of performance

o **Business applications**

- Hydraulic circuits in agricultural equipment; forces generated by hydraulic energy (suspension, steering, motorization) - Balancing of mechanical components

- Protection and prevention of vibrations
- Servo systems in agricultural equipment: injection pump regulators, pick-up clutch power
- Sound level of agricultural equipment; soundproofing ; standards and protective equipment - Control and power electronics
- Electrical risks
- Cells, batteries, fuel cells present on the equipment
- Usual and alternative fuels
- Speed cameras
- Exploitation of on-board sensors on vehicles: Ultrasonic sensors, optical sensors - temperature sensors

- Infrared cameras
- Thermal motorization
- Energy converter, electrical converters present on the equipment
- Cooling, heat exchange in agricultural equipment
- Thermal insulation of vehicles
- Air conditioning

S5. Knowledge of the agro-technical point of view of the customer environment of agricultural equipment

Technological knowledge	Level 1 2 3 4
S5.1 Crop production	
In phytotechnics, the different themes are seen from the perspective of reducing inputs in order to limit the impact on the environment as much as possible. The agronomic dimension (respect for the soil) is present in the choice of a technical route or equipment.	
S5.11 - Typology of representative crops cereals (wheat, barley, oats, sorghum) root crops (maize, beets) oilseeds - protein crops (rapeseed, sunflower, soya) fodder (hay, silage, immature) vines, fruit trees market gardening *presentation of productions, their uses, their geographical distribution, the evolution of cultivated areas, market trends.*	1 2 3 4
S5.12 - Soil and its environment **The soil, its characteristics** • Physical - (texture, structure, water content, cultural profile) • Physico-chemical (clay-humic complex, constituents, Ph, vital minerals, organic matter) • Biological (living beings in the soil) • Soil analysis • The humic balance of the farm	1 2 3 4
- presentation of the soil as a physico-chemical support for plants. - presentation of optimal conditions for root development and plant emergence to preserve yield potential ; - Demonstration of the mechanisms of fixation of the elements on the complex and of the evolution of the organic matter in the soil ; - presentation of the balance of humic matter through examples ; - presentation of soil analysis as a decision support tool (limited to the reading and interpretation of results)	
Compaction of agricultural soils • Origin Sensitivity • • Evolution • Consequences • remedies	1 2 3 4
- presentation of the effects of superficial and deep soil compaction on crops : - Highlighting the parameters involved in the compaction of agricultural soils ; - Mention of the optimal conditions for carrying out the work for the respect of the soil ; - Mention of remedial solutions.	
S5.13 - Typology of crop preparations Traditional technical itineraries • Stubble cultivation • Plowing • Recovery • Surface preparation	1 2 3 4

	• Sowing					
Roles and conditions of these different operations. Highlighting the agronomic and climatic constraints influencing the choice of tillage, the agronomic result obtained according to the tool used in relation to the soil worked and the need to use a tool adapted to the soil to be cultivated.						
	Simplified technical itineraries • Deep work without reversal • Superficial work • Direct sowing					
Presentation of the specificities of each technique, agronomic and climatic aspects, economic, organizational and material impacts .						
	Seedlings • Germination conditions of the sown variety • Crop profiles and seedbeds • Determination of the stand • Concept of yield objective • Types of seedlings					
- The conditions for good sowing according to the types of seeds sown and the profiles sought ; *- Concept of optimal population for the expected yield objective ;* *- Highlighting the possible losses from sowing to emergence ;* *- Presentation of conventional, unconventional, under cover or direct sowing;* *- Specification of shallow or deep tillage mode, full width or line of sowing.*						
S5.14 Typology of monitoring		**1**	**2**	**3**	4	
	Chemical fertilizer spreading • Plant nutrient needs • Commonly spread fertilizers • Rationale for NPK fertilization • Regulations regarding spreading • The influence of the location of the fertilizer during sowing and post-emergence					
- Use of the soil analysis fertilization report and the institutes' recommendation models; *- Presentation of the physical and commercial form of the products, quantities, production, use storage ;* *- Presentation of solutions to control the result obtained and to reduce the quantities made according to European standards and local regulations*						
	crop protection • Crop enemies • Different forms of control • Phytosanitary products					
- Presentation of crop enemies and their mode of propagation (weeds, insects, diseases) ; *- Presentation of the different forms of struggle and highlight the combination of means mechanical and chemical ;* *- List the characteristics of phytosanitary products, physical and commercial form (herbicides, insecticides, fungicides) ;* *- Notions of acute and chronic toxicity and persistence related to the use of products;* *- Rules for the supply, storage and use of these products*						
	Product application • Modes of action • Types of spraying • Conditions for success • Product types, storage and precautions for use • Application regulations					

• Management of phytosanitary effluents on the farm	
- Presentation of the principles of obtaining spray drops ; - Demonstration of the optimal conditions for applying the treatments ; - Definition of efficacy criteria according to the different types of treatment ; - Highlighting drift phenomena and remedies ; - Definition of the provisions planned for the dilution of the products in the field.	
Crop irrigation • Sum of temperatures and water balance: basic notions, measurements, crop needs, regulations regarding the use of resources.	
- Interest in knowing these notions for crop management ; - Assessment of crop temperature needs ; - Definition of water needs leading to the calculation of equipment flow ; - Legislative provisions planned for the control and monitoring of water consumption ; - Impact of irrigation on fertilization ; - Raising awareness of water savings (leaks and waste) and the means of protecting crops against evaporation.	
S5.15 Typology of harvests **Grain harvesting** • cereals (wheat, barley, oats, rye, etc.): use and destination of grains, physiology, requirements, characteristic stages, grain harvest stage and optimal conditions, residue management.	1 2 3 4
- Presentation of the plant, its environment and its operation in a simplified way ; *- Definition of its needs according to the stages ;* *- Definition for harvesting of working conditions and organization of construction sites ;* *- Identification of crop residue management solutions, particularly for straw (shredding, incorporation of straw and chaff or removal) ;* *- Agronomic and economic interests of each straw treatment solution.* • root crops (maize,	
sunflower, sorghum, oleo protein crops, etc.): use and destination of harvested grains and by-products, physiology, requirements, characteristic stages, grain or whole plant harvest stage and optimal conditions, residue management, storage and conservation of the harvested product.	
- Presentation of the specificities of grain harvesting for these plants ; - Presentation of technical solutions for shredding and incorporating residues ; - Description of grain storage and conservation solutions.	
Harvesting fodder • grassland plants (grasses, legumes): use and destination of fodder, physiology, requirements, characteristic stages, harvest stage of the plant and optimal conditions, storage and preservation of the harvested product - *Presentation of the plant, its environment and its operation*	
in a simplified way ; - His needs according to the stages ; - Harvesting conditions to obtain a quality product ; - Presentation of dry harvest chains ; - Presentation of wet harvest chains ; - Presentation of the different solutions for storing and preserving the product ; - Harvesting conditions to obtain a quality product. • immature plants (maize, sorghum, immature cereals, etc.): whole plant harvesting, storage and conservation of the harvested product, organization of harvesting sites.	
- Presentation of the functions of the silage harvesting machine through its architecture ; *- Definition of optimal settings ;* *- Description of on-farm harvest storage and conservation solutions ;* *- Description of the organization of a harvesting site with a view to optimizing time and yields, -* *Comparison of different sites according to agronomic, technical, environmental and economic criteria.*	

The vine and local productions

• The conduct of this production • Cultural constraints

• The organization of harvest sites • The storage and conservation of the product

- presentation of the various works for the conduct of cultivation ; - Description of on-farm harvest storage and conservation solutions.

S5.2 Animal production

1 2 **3** 4

In zootechnics, general knowledge of animal production. Dimension environmental protection; the starting point for bringing buildings up to standard is the law on water.
Particularities of each production. For the treatment of animal waste, the equipment is designed in relation to the planned provisions (composting of solid matter, separation of phases, eco-composting, spreading rules).

S5.21 - Typology of representative farms meat production

milk production production constraints

traceability circuits for finished products

breed improvement

1 2 **3** 4

- presentation of the productions, their geographical distribution, the evolution and the tendencies of the market ;
- brief presentation of the distribution channels for meat and milk ; - presentations of the most representative farms ; - definition of simple concepts concerning reproduction, artificial insemination and selection.

S5.22 - Animal feed

converting food into nutrients

the different feeds, form and composition the rationing,

the mixed ration the organization of the herd and the

forage balance the storage of feeds the manufacture of

feeds on the farm

1 2 **3** 4

- limitation of the physiological study to the passage of food in the blood in a succinct way ; - Shape and quality of the product distributed for the best value. Advantages of rationing (mixed ration, weekly distribution) in relation to the use of machines, intervention time and work flexibility ; - Presentation of storage and conservation solutions, their limits, their constraints ; - Quality of the work carried out ; - Example of cattle breeding.

S5.23 - The practical management of farms Livestock buildings: the general organization of buildings, technical standards, habitat improvements, interior farm facilities.

1 2 **3** 4

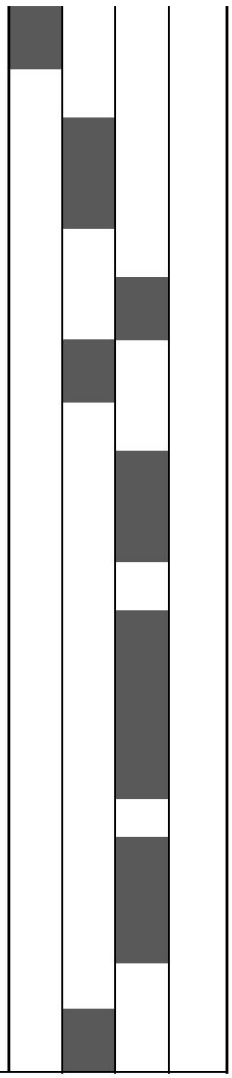
- Presentation of the internal architecture of the buildings according to the regulations ;
- Notions of hygiene and animal comfort ;
- Solutions concerning ventilation, aeration and heating of premises ;
- Presentation of solutions for restraining, moving and resting animals

Animal manure (manure, slurry, slurry): its form and the quantities produced, the regulations provided for the treatment of manure, the extraction of buildings and storage, the rules and practices for spreading, the other materials spread

- Presentation, through the law on water, of the agro-environmental measures concerning the treatment of livestock effluents and bringing buildings up to standard.
- Presentation of composting, eco-composting or phase separation solutions for slurry ;
- Presentation of solutions for the limitation of odors and diffuse pollution ; - inventory of by-products spread and their use.

	Harvesting and storing milk: animal milking, indoor milking facilities, milk storage devices, robotic milking.					
	- Principle of milking physiology (preferred cattle breeding) ; - Presentation of commonly encountered milking facilities ; - Presentation of milk preservation solutions ; - Presentation of the robotization of milking according to different points of view (comfort, management, safety, performance).					
S5.3 Agro-environmental measures	Precision farming concepts Recording of practices Intra-plot management Sustainable development Organic farming, status and outlook Rational and optimized use of material resources		**1 2 3** 4			
	- Evidence that precision agriculture requires the recording of practices ; - Presentation of the rules of sustainable agriculture that respects the environment (control of spreading, reduction of inputs, preservation of vulnerable areas) ; - Presentation of recommendation maps and the establishment of plant cover ; - Explanation of the impact and evolution of community rules on the practices and definitions of the various acronyms and terms used (ZNT, CIPAN, PDD, PMPOA) ; - Examples of on-farm measures such as "environmental green plans" ; - Highlighting the adequacy between the material and human resources and the SAU. **1 2 3** 4					
S5.4 Knowledge of “manufacturer” products						
	S5.41 Typology of equipment and impact of technological developments					
	Through the panel of existing equipment, presentation of technological principles, performance and usage constraints. Clarification of terms usually used as needed.					
	Soil preparation tools • The different families of tools for decompaction, plowing, surface work, the different types of active elements, their agronomic implications. • The various materials for destroying weeds and residues of harvest. Tools for preparing seedbeds and seedbeds • The different materials for preparing the seedbed. Principles of action of animated and towed tools and their agronomic implications. • The different sowing materials, their characteristics, adaptation to the crop and the soil. • Combinations of soil preparation and sowing equipment, after ploughing. • The characteristics of direct seeding equipment. • Sowing quality control devices. Crop monitoring tools: • The characteristics of solid fertilizer distribution equipment (fertilizer, lime, manure, etc.), liquid, gaseous					
	Presentation of the qualitative spreading conditions, quantitative distributions on the plots (regulation, control of mapping, etc.), aids for controlling the distribution of doses or spreading. • Irrigation installations, their principle and the constraints of use.					
	Crop protection tools :					

• The characteristics of the treatment equipment (spraying) according to their method of application and the crop. • The different regulation systems and their principle. • Families of nozzles and anti-drift devices. • Automatic control of sprayer components (section control, rinsing in the fields, etc.). • The characteristics of mechanical weeding equipment. Harvesting tools: • The characteristics of the grain harvesting machines (the combine harvesters). • The characteristics of forage harvesting machines. • The characteristics of root harvesting machines and tubers. • The characteristics of fruit harvesting machines (grapes, apples, pears…)	
For these different machines Presentation of the principles of action and organization of the active elements, the different configurations depending on the type of crop, the systems for monitoring, controlling and recording quantitative and qualitative performance (driving assistance) .	
Product processing equipment (vinification, cidrification, manufacture of animal feed, etc.) Farming tools: • Principles of feed preparation and distribution equipment. • Equipment for cleaning, evacuation and treatment of manure (slurry, manure). Other materials • Herd monitoring equipment. • Product collection equipment (milk, eggs). • Storage, packaging and transport equipment for products and animals.	
For these materials, only the operating principles are highlighted.	
Technological developments • Driver assistance and automatic tool piloting systems. • Systems that enable the development of agriculture in precision. • Milking robots. • Performance monitoring and recording systems • Energy expenditure limitation systems	
General presentation of systems and interests for the farmer.	
S5.42 Operational functions	1 2 3 4
Applications may take the form of functional studies, implementation with adjustments or configurations as well as functional checks on representative machines or equipment.	
The tractor-implement connection • The impact of the settings of the different implement hitches on the work desired and on performance. • The impact of the choice of tires and the inflation pressure according to the technical characteristics and the compaction of the ground. • The impact of fitting tires or tracks to reduce soil compaction.	

	• The various tool control strategies (remote controls, ISO-bus link, communication interface, etc.) Soil preparation tools • The different types of active elements, their agronomic implications. • The energy, economic and agro-environmental aspect of their use and adjustment. Tools for preparing seedbeds and seedbeds • The different types of seeders, their use and the main settings for obtaining quality seedlings. • Agronomic, economic (installation costs) and technical constraints in the choice or implementation of equipment. Crop monitoring tools: • The adjustments and settings of the equipment for distributing the fertilizers. • The dimensioning of a simple irrigation installation. Crop protection equipment: • Adjustments, settings, controls of spraying or liquid fertilization equipment. • The choice of nozzles according to agro-environmental and economic constraints. • Verification of the compliance of sprayers with respect to applicable regulatory requirements. Harvesting equipment: • The main functions of harvesting machines, the constraints of use. • The different configurations and settings of harvesting equipment in order to to optimize production. Livestock equipment: • The influence of fodder recovery and distribution equipment and their settings on feed quality.	

S6 Professional Methodology in Industrial Technology

Technological knowledge S6.1 Functional, structural and behavioral analysis tools	LEVEL 1 2 3 4			
The objective is to make the future senior technician able to : *• describe the functional organization of a system or subsystem • analyze the constructive solutions performing the technical functions • check all or part of the performance of a system or subsystem.* *This knowledge constantly presented as elements of solutions to problems related to activities :* *• repair or troubleshooting of systems • diagnosis or configuration • after-sales or sales • design-adaptation* *Knowledge will be built from : • activities* carried out on real, didactic or virtual systems which will allow to observe, measure, analyze, interpret and deepen in particular with a view to better efficiency in the search for breakdowns or malfunctions • summaries based on activity cycles which will make it possible to identify the fundamentals. (*): examples of activity: assembly-disassembly, use of simulation software, measurement, case study.*				
S6.11 - Representation tools • Service functions and technical functions • Representation tools: FAST, interactor diagram • Expression of need, functional specifications. • Energy chain o Feed, Distribute, Convert, Transmit • News channel o Acquire, Process, Transmit • Volume representation of systems o Part, assembly, construction tree, constraints assembly, drawing, exploded view, perspectives, nomenclature • SysML diagrams • Schematization o Block diagram, kinematic diagram, technological diagram, architectural diagram, hydraulic and pneumatic diagram, electrical diagram. • Manufacturer documentation • Cause-effect diagram • Description of event-driven logic systems o State graph, flowchart, Grafcet, flowchart, diagram of Gantt. o Mind maps				

S6.12 - Modeling tools 1 2 3 4

The senior technician in Techniques and Services in Agricultural Equipment is not a design expert. *This is why: - this knowledge is brought into play on simple analytical models. - the use of mechanical, electrical, pneumatic and hydraulic simulation software is essential under the following conditions: A. in the analysis phase, the models are provided to focus on the following concepts: understanding of the hypotheses put forward identification of the input and output quantities the evolution of the input and output quantities the identification of the parameters influencing the input-output law the definition of the domain of validity of the results*

the analysis of the deviations obtained by a possible measurement on the real or didactized system

B. the design of the models is only done in the design-adaptation phase.

S6.121 - Action Chain Modeling 1 2 3 4

o **Link modeling**

Nature of the contacts: point, linear, surface. Local coordinate system and degree of freedom. Normalized representation.

Mobilities, isostatism and hyperstatism.

o **Modeling of mechanical actions**

Mechanical actions at a distance, mechanical actions of contact, actions transmitted by perfect and real connections.

Representation using torsor.

Friction (Coulomb model), grip, contact pressure, rolling resistance, pivoting resistance.

o **Kinematics of the solid**

Absolute movement, relative movement.

Position, trajectory, speed, acceleration.

Definition and identification of movements: translation, rotation around a fixed axis, helical, plane movement.

Representation using torsor.

Case of plane movements: instantaneous center of rotation, equiprojectivity, composition of movement, sliding.

For plane movements, graphic methods are preferred in order to have the minimum level of expertise necessary for the use of software. o **statics** Fundamental principle of statics and theorem of reciprocal actions Isostatism and hyperstatism Resolution of a statics problem analytically, graphically or numerically. 1 2 3 4

The analytical resolution is limited to 4 torques and used only for 3D problems.

The graphical resolution is limited to 2D problems in the case of 3 or 4 non-parallel support sliders. In all other cases, the use of software is required. o **Dynamics** Description of periodic phenomena Transient and permanent regime, resonance

Characteristics of inertia of solids: center of gravity of a set of solids, moment of inertia with respect to an axis 1 2 3 4

Fundamental principle of dynamics applied to solids in translational motion rectilinear and solid in rotation around a fixed axis.

Static and dynamic balancing of a rotating solid around of a fixed axis.

For inertial characteristics, limited to simple calculations. During the tests, no analytical calculation will be required to determine the characteristics of inertia. They will be given or a form or the results from a 3D modeler will be used. Time equations of uniform and uniformly varied motions obtained by integration are seen in mathematics. The use of software makes it possible to understand the influence of the various parameters (geometry, density) on the values of the characteristics of inertia. **1 2 3** 4

o **Materials**

Typology
Areas of use
Characteristics and abilities: mechanical characteristics, environmental impact.
Designation
Main treatments of metals and metal alloys Function-material-geometry-process interaction

Limited to a general culture on the materials which is built up throughout the activities carried out during the training. The measurement of the environmental impact is obtained with software. **1 2 3** 4

o **Strength of materials**

assumptions and range of validity
Calculation of stresses and deformations for simple stresses: traction-compression, shear, bending, torsion.
Concentration of stresses
Stresses and deformations of thermal origin
Fatigue Buckling Principle of superposition
applied to the stress bending tension Criteria of resistance Elasticity (numerical approach exclusively):

- type and dimension of the mesh
- conditions to the limits
- displacements -
- loadings *The*

hyperstatic systems are not approached analytically, nor the analytical calculation of the deformation in bending.

S6.122 - Modeling of the energy chain o **1 2 3** 4

Mechanical energy Potential of gravity and elastic Kinetics of translation and rotation Work, power of a force, of a couple Theorem of kinetic energy o

Hydraulic energy

Pressure, flow
Hydrostatic
Powerful
Flow Conservation
Reynolds number, laminar and turbulent flows
Load losses
Conservation of energy (Bernoulli)
Viscosity
Hydrodynamic
Pollution and consequences in contacts

Applications approached starting from problems of analysis of operation, choice or control of the performances of components and hydraulic systems. Hydrodynamics is limited to the treatment of lubrication problems. Definition of influential parameters and their orders of magnitude. o **Electrical energy** Power Input and output characteristics of distribution and modulation components

Input-output relationships, effort, torque, power, speed of the different electric motors o **Thermodynamics**

First and second principle
Evolutions of ideal gases, transformations: isobaric, isochoric, isothermal, reversible and irreversible adiabatic, polytropic
Internal combustion engine cycle
Cycle of an air conditioning system
Compressors and turbochargers
Power improvement
Yield

Highlighting the influence of parameters on the progress of a cycle (for engines: volumetric ratio, filling, combustion progress and for air conditioning, pressures and temperatures throughout the cycle) o **Conservation of energy** o **Conversion, efficiency** o **Energy balance**

S6123 - information chain modeling	**1**	**2**	**3**	4

o **Information**

Nature of information (logical, analog, digital)
Information Conversions
Numbering systems Characteristics
and temporal evolution of a signal Transport of information
(metallic conductor, optical fibre, radio medium).

o **Processing system**

Comparison
Amplification
Filtering
Hardwired or programmed logic
All or nothing command
Regulation
Enslavement
- setpoint, loop, deviation -
speed, response time - accuracy -
stability
- proportional, integral and derivative correctors

Simulation software or measurements on didactic or real systems make it possible to see the influence of the various parameters.

o **Disclosure of information**

Communication buses and networks
General external characteristics (types of information exchanged, bit rate, response time).
Protocol concept

		Concept of frame: sending data on the network or on the bus Communication. Configuring a link.		

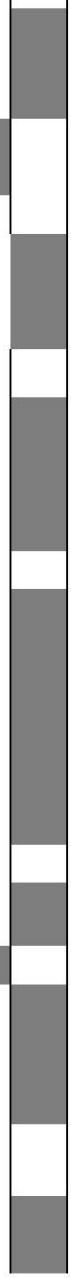
S6.2 Diagnostic methodology		1 2 3 4			
	S6.2.1 – Diagnostic approach, list of diagnostic steps				
	• Risk analysis (see S9) o Identification of risks o Application of protective measures o Knowledge of the necessary clearances • Finding faulty hardware information o History of failures o Conditions of use of the equipment by the user o Circumstances of the failure o Technical documentation • Identification of the failure o Localization process o Identification of the faulty function o Observation of the fault. • Search for the faulty channel o Identification of the faulty chain: energy chain or information chain. • Search for faulty links in the chain o Use of test tools o Identification of faulty elements • Identification of the cause(s) of the failure.				
	S6.2.2 – Tools for diagnosis				
	• Test criteria o Speed. o Probability o Accessibility • Test procedure o The principle of the test. o Location of the test o choice of measuring instrument o procedure o interpretation of the results compared to the expected • List of failure modes o Analysis of failure, breakdown (methods and tools of analysis)				

S6.3 Maintenance strategy					
S6.3.1 – Maintenance function	**1 2**	**3**	4		
• Maintenance policy and objectives • Maintenance strategies and selection criteria • Types of maintenance: o Corrective maintenance: 1. Choice of type of corrective maintenance. 2. Content of an operating range, of a procedure o Preventive maintenance (regulatory and others): 3. Systematic maintenance 4. Condition-based maintenance 5. Predictive maintenance. 6. Notion on operations research methodology preventive measures and criteria for choosing preventive operations • Documents associated with the preventive maintenance plan Use of preventive maintenance data. Use the preventive maintenance monitoring sheets (specify the actions to be taken) Process for optimizing the preventive maintenance plan. • Maintenance functions (study, preparation, scheduling, implementation, management).					
S6.3.2 - Reliability	**1 2**	**3 4**			
• Definition • Standards • Reliability indicators: o Number of failures o Average failure rate • Criteria for choosing reliability indicators.					
S6.3.3 – Maintenance cost	**1 2**	**3 4**			
• Costs related to maintenance					
S6.3.4 – Maintenance indicators	**1 2**	**3**	4		
• Techno-economic indicators • Choice of indicators • Methods and tools for analyzing maintenance indicators					
S6.3.5 - Control tools	**1 2**	**3**	4		
• Oil analysis: Contamination of oils; Degradation of oils; Sampling techniques; Methods of analysis (notions). • Other control tools (vibration analysis, thermal camera, etc.)					
S6.3.6 – Maintenance organization and logistics	**1 2**	**3**	4		
• Scheduling o Load and capacity of a maintenance department o Needs and constraints o Schedule • Use of maintenance software. • Intervention management and analysis: o Triggering and follow-up of an intervention o Information to collect o Analyzes to be carried					
out **S6.3.7 – Types of maintenance contracts linked with STMG**	**1 2**	**3**	4		

	• Content of a maintenance contract • Technical clauses				
	S6.3.8 – Quality	**1 2 3** 4			
	• Definitions; challenges ; company quality organization; insurance quality • Current certifications; Quality tools **S6.4 Implementation**				
methodology					
	S6.4.1 – Methodology	**1 2 3** 4			
	• Rule of use of the material • Learning of the functionalities • Evaluation of the expected performances • Compliance testing • Recording of results **S6.4.2 –**				
	Customer service contract:	**1 2 3** 4			
	• Implementation • Training in proper use • Equipment optimization and development • Machine warranty				
	S6.4.3 – Implementation stage : • Definition of	**1 2 3 4**			
	implementation stages • Development of procedures. • Search for elements (settings, values, limits) • Application of the procedure • Analysis of deviations • Report				
	S6.4.4 – Repair step. of the intervention : • the definition of the	**1 2 3** 4			
	stages of the repair, the intervention, the artwork • research or development of intervention procedures, settings, adjustments, configuration, reprogramming, tests • Search for critical safety points • Choice of tools • Organization of the workstation • Carrying out the repair or intervention. • Recommissioning or testing • Report • Recycling, waste management • operating mode • interpretation of the results compared to the expected				

S65 Organization and monitoring of a		**1**	**2**	**3**	4	
	project • Competitiveness Deadlines, markets, competition. Value of a product. Technology watch. **• Principles of organization and planning of a project** sequential development dividing the project into phases group work project reviews • **Tools for finding solutions** **• Evaluation of risk taking in a project by the choice of technological solutions (technological innovations, concept of overall cost, technology watch). • Management, follow-up and finalization of a project**					

S7 Industrial Technologies

Technological knowledge				
Observation: The knowledge associated with S7 will adapt to technological developments such as the appearance of ABS, new energy converters, associations of converters, improvements in energy saving and impact environmental.				
S7.1 Energy converters S7.11 – Heat engine				
	The functional analysis of the heat engine is covered in knowledge S6-11. For each element, the evolution of the parameters is highlighted by tests.			
	Preparation and renewal of the fuel load • Systems for supplying, metering and introducing fuel into the cylinders • Fuel load optimization parameters • fuel characteristics and their influence on efficiencyÿÿ • Substitution fuels, adaptations to engines. **Combustion** • Procedure • Hazards • Quality factors **the introduction of the oxidizer** • filtration, distribution • air filling enhancement systems o conventional systems o air boosting • circuit architecture • technological characteristics of components • parameters influencing the operation of circuits • maintenance characteristics (parameters for maintaining circuits in good condition) • characteristics of fluids (identification, protection, choice) • Filtration (importance, characteristics of elements, choice) **Depollution of combustion engines** • The various pollutants and the parameters influencing their emissions • standards, legislation • depollution systems • measurements and analyzes of polluting gases in after-sales • influences of the systems on the characteristics (consumption, Powerful) **The main and secondary characteristics (torque, power, hourly consumption, specific consumption)** • Determination of characteristics • Measurement of characteristics on the test bench.			

	• Analysis of the measured characteristics				
	The characteristics, readings on test benches and/or on machines, make it possible to highlight malfunctions and the analysis of defects.				
	S7.12 - The alternator, the hydraulic pump, the compressor Types of systems Regulation and servo- control systems Main characteristics Records of characteristics and analysis of measured performance *The parameters for checks, tests and maintenance of characteristics are* *studied from measurements carried out in practical work.* **S7.13 – Technological developments in terms of converters**				
	hybridization fuel cells				
S7.2 Energy storage batteries and their charging system (constitution, characteristics, charging method, maintenance) hydraulic accumulators (checking, sizing) pneumatic accumulators (checking, sizing)					
S7.3 Energy use	**S7.31 - Transmissions of power to the wheels** Architecture of the different types of transmissions • Mechanical • Electrical • Hydraulic Modulation of parameters (torque, speed; voltage, current; pressure, flow) • Typology of solutions, description, diagram, analysis of operation on the most representative • Parameters influencing performance • Functional characteristics • Clutches, converter and coupler Distribution of power to the wheels • Axle, reduction gears • Front/ rear preponderance • Differential lock Wheel/ground connection • Tires (characteristics, dimensions, choice) • Geometric characteristics of vehicles (highway code, track, wheelbase, etc.) • Suspension Braking • standards and regulations • type of brakes for tractors and attached implements Service brake Parking brake Tractor/implement connection • The different technologies and commands				
	S73.2 – Auxiliary energy use				

Architecture of the most representative circuits in mechanics, electricity, hydraulics and pneumatics (examples: lifting, power take-off, starting circuit, circuits of hitched or towed machines).

Analysis of electrical, hydraulic, pneumatic and mechanical diagrams representative of energy and information chains. • Technical characteristics of the components of the two chains • Input, output and control quantities • Implementation, adjustment, maintenance and analysis of malfunctions **S7.4 Comfort – Driving assistance**

User comfort

• Air conditioner

• Cab suspension • Concepts of ergonomics of the driving position

Driver assistance tools :

• Geolocation • Guidance and automated driving assistance

S7 Acquisition, transmission and processing of information

Chapter seen from the maintenance point of view. The laws or physical principles are specified in the physics program, in SII limitation to the statement of the characteristics of the elements in their context of use by measurements on vehicles or didactical systems. This chapter deals with the influence of the parameters and the analysis of faults.

S7.51 - Embedded electronic systems General architecture.

• The news channel.

o Processing unit.

o Dialog and communication

• The energy chain.

Reading and decoding electrical schematics. • Representation standards (DIN, manufacturer specific). • Implantation scematic

S7.52 - Information acquisition

Identification of the different types of sensors.

Recording and interpretation of sensor signals.

Sensor control.

S7.53 - Information processing

Architecture

• The internal block diagram of the computers. (stage, microcontroller, output stage).

• The families of electronic components used for the calculators. (CPU, memories (rom, ram, flash eprom), input stages, output stages, power supply).

• Computer programming.

The structure of the programs

• Combinatorial logic: truth table and logical equation(s), memory function. • Sequential logic: notions of sequences, cycles, mode degraded.

• Operating and emergency strategies.

Input interfaces

- All or nothing.
- Analog (analog/digital conversion). • Frequency (up/down counting, sampling). • Protection of input stages.

Output interfaces.

- All or nothing.
- RCO.
- Digital.

Failure analysis

- Test by the computer, short circuit to plus, short circuit to minus, open circuit). • Input-output control method

S75-4 – Communication and transmission of information

Communication medium • Physical medium and bus classes. • Computer network organization (CAN, iso bus). • The electrical characteristics of the communication interfaces. • Signal characteristics (voltage level, frequency). • associated electrical controls. • Message Format.

Actuators and pre-actuators.

- Equivalent electrical model. • Functioning principles. • Analysis of signals (U and I) in relation to the operation of the actuator.
- Associated electrical controls.

Actuator and pre-actuator control modes. • Operating principle • Technological solutions • Associated electrical controls

Knowledge S8: Professional Methodology in Economics-Management

	Technological knowledge	LEVEL 1 2 3 4	ST MG	IIS
	The professional methodology teaching in economics and management in STS Techniques and Services in Agricultural Equipment has a double objective: the construction of a general culture in the field of the economic and legal environment, and the functioning of an agro-business. -equipment by addressing some of the major current themes mobilizing knowledge and reasoning from these disciplinary fields. the contribution to the construction of professional skills with the status of support education, consistent with other professional education. It is a question of understanding and taking into account the economic and legal factors which will influence the activity of the holder of the diploma. The many transversalities between vocational education should be underlined.			
S8.1 The company				
	S8.1.1 Company typologies and characteristics • Cut • Legal structure • Organizational structure.			
	Observation: *the contents of a notional and/or statistical nature are presented by observing and analyzing real situations in the professional agricultural equipment sector.*			
	• The agricultural world and its various players o Importance and economic development of the agricultural sector o Diversity of businesses and decision-making structures o Professional bodies o The European and global environment The single European market The common agricultural policy: challenges and difficulties. The impact of globalization o Financial auxiliaries (credit and insurance organizations) • The builders o Identification, typology and location o Economic data of the sector **S8.1.2. The company and its market** • The marketing approach. • Market analysis. • Marketing actions o Construction and promotion of the offer o Communication and distribution of the offer			
	Observation: *Consideration of the "product support" market, ie not only that of after-sales service but of all the products and services concerned by the fleet of customer equipment offered for sale.*			
	S8.1.3. Management tools • The company's financial policy o Sustainability and performance			

	Assets and activity (balance sheet and income statement) The costs Understanding cost components (variable and fixed costs, direct and indirect costs) Highlighting discrepancies (actual costs recommended costs) and identifying possible causes Profitability (margins, break-even point) o Development and performance The choice of investments The different financing resources	
	Observation: *reading of the summary accounts (balance sheet and income statement), without an accounting approach. The application of management tools is based on cases related to the agricultural equipment sector.*	
	• The estimate o The database o Operation times o Charged costs o VAT o The standard letter	
	Observation: *even if conformity to reality is not always possible with exhaustive precision, the data are, as far as possible, consistent with those of the professional sector, both for the identification of the imputed costs and for the likelihood of the timing. VAT limited to a simple understanding of its definition, purpose and calculation mechanism in invoicing.*	
	• Stock management o Concept of storage o The different levels of stocks o Current methods of stock management **S8.2 The legal framework of the**	
company's activities		
	S8.2.1 The general framework of legal life • The sources of law • The judicial organization in France ***Observation:*** *the integration of European and international law into French law is imperatively seen when necessary. The existence of the Rural Code and maritime fishing is important..*	
	S8.2.2 The legal framework of the contractual relationship • Obligations o The general principles of contracts o Obligations related to repair and sale o Obligations related to the estimate (reservation clauses, limit of validity, services offered). o The concession contract • Liability (civil, criminal) **S8.2.3 The legal regime of the employee in the company** • The employment contract and its modifications • Conventions and collective agreements • The rights and obligations of the employee • The obligations of the employer • Information and protection of the employee in the company **S8.2.4 Protection of**	
	innovation • Operating monopolies and their protection	

	o The National Institute of Industrial Property o The trademark o The patent • Remedies o Infringement action o Unfair competition action						
S8.3 Communication and Negotiation							
	S8.3.1 Communication to customers • Communication in the interpersonal relationship o Self-knowledge (locating oneself in the relationship) o Taking the other into account (social codes and professionals, locate the interlocutor in an existing typology) • The tools of professional communication o The tools of oral communication: Persuasive communication (its socio-cultural and psychological factors). Observation, role and interpretation of the non-verbal in the interpersonal relationship and the group relationship (decoding of non-verbal communication in conflict prevention). Techniques of positive influence (transmission of knowledge, life skills, know-how) and questioning (interest of active listening, notions of otherness and empathy, importance of questioning and reformulation). Managing stress in a communication situation. o Written communication tools: The different types of documents: the memorandum, the report. the invoice, the OR, the documents followed by the quality procedures The rules specific to professional and commercial writings (form, vocabulary). Rules specific to the company (graphic charter, standard letters, etc.).						
	Observation: *consideration of new communication tools.*						
	S8.3.2 Negotiation Preparation phase: o Objectives o Forms of negotiation o Arguments o Negotiation margins • Negotiation stages : o Getting in touch o Discovery of the needs of the interlocutor o Proposal of solution, argumentation o Conclusion and taking leave						
	Observation: negotiation adapted to the context of the agricultural equipment sector.						

S9. Occupational health and safety, ergonomics

	Technological knowledge	Levels 1	2	3	4
S9.1 Occupational health and safety issues					
	Safety is a major issue present in each of the activities of the senior technician in maintenance of agricultural equipment. The health of personnel must be guaranteed while also ensuring the preservation of property and the environment. The approaches implemented are based on the recommendations of the National Health Insurance Fund for Salaried Workers (CNAMTS) and the National Institute for Research and Safety (INRS). Occupational Health and Safety (HE&ST) will be widely used to provide this S9 knowledge. **S 9.11 Definitions associated with risk prevention** • Accident at work, commuting accident, mission accident and occupational diseases. **S 9.12 Statistical elements specific to the professional branch** • Breakdown of types of damage and causes of accidents at work, • Breakdown by category of occupational diseases, • Direct and indirect costs. **S 9.13 Regulations** • General prevention principles and the regulations associated with these principles, • Internal and external risk prevention stakeholders in the company, • Single risk assessment document (DUER), • Hygiene, Safety and Working Conditions (CHSCT), • Prior authorizations and authorizations to drive.		■		
S9.2 Knowledge of main risks					
	S 9.21 Risks related to the working environment • Risks related to the movement of machines, • Risks related to the presence of chemical and phytosanitary products, • Risks of electrical origin, • Risks related to the atmosphere (high noise). **S 9.22 Risks linked to the use of means** • Risks linked to machines and tools, • Risks linked to the use of lifting, wedging and handling means. **S 9.23 Risks related to work situations** • Risks related to maintenance operations on equipment (in particular energy logging procedures), • Risks related to physical activity, • Risks related to working at height.		■		
S9.3 Prevention approaches S					
	9.31 Risk control approach • Terminology: hazard, dangerous situation, dangerous event, damage, avoidance, risk, probability of occurrence of damage, severity of damage, estimation of risk, evaluation of the risk, • Schematization of the process of appearance of damage, • Hierarchy of prevention measures: intrinsic prevention, collective prevention, individual prevention, prevention by instruction, authorization, • Implementation of the approach: identification of the tasks related to the work, identification of dangerous situations, estimation and evaluation of risk, • Research into preventive measures.				■

	S 9.32 Accident analysis approach • Terminology: fact, judgement, interpretation, anteriority, multi-causality, potential accident factor, • Implementation of the approach: collection of facts, construction of the tree of causes, Search for preventive measures **S9.33**				
	Ergonomic approach • Terminology: effects, actual work, prescribed work, determinants, • Principles of implementation: collection of company data, collection of effects, observation of real work, development of the understanding diagram, hypotheses of cause-effect relationships, validation of hypotheses, • Seeking to improve work situations. **S9.34 Prevention of risks related to Physical Activity** • Training in the prevention of risks linked to physical activity – Industry, construction and trade (PRAP IBC). **S9.35 Prevention of electrical risks S9.36 What to do in the event of an accident** • Training Rescue – Occupational First Aid (SST). **S9.37 Safe operation of machinery** • With reference to CNAMTS Recommendation R372 modified category 10 ***Observation :***				
	Knowledge S9-31 is seen in parallel with knowledge S6-2. *Knowledge S9-35, S9-36 and S9-37 are approached from a theoretical point of view and allow preparation for the corresponding authorizations.*				
S 9.4 Safety, regulations					
	S 9.41 Safety in the company and on site • Identification: symbols, colors, signals, • Procedures and instructions for: traffic, fire, evacuation, risks exceptional, • Mode of use of emergency means: fire extinguishers, fire network, fire blanket, showers, eyewash,…, • Individual and collective protection: work clothes and safety equipment protection, adaptation of work clothes and protections to the dangers incurred, safety of the lone worker, • Safety when handling loads: identification of lifting points, identification of the mass to be lifted, choice of suitable lifting means, balancing of the load, delimitation and identification of the safety zone, • Safety related to materials and their equipment: securing before intervention, storage and use of products (fuels, oils, solvents, etc.), storage and charging of batteries, capacities containing gases under pressure (gas cylinders, compressed air tanks, tires, hydropneumatic accumulators), interventions on circuits with fuel, work on hydraulic circuits (mechanical blocking of equipment, risks related to pressure), work on electrical equipment or environment, work on moving mechanical systems (protective casings), driving and maneuvering equipment safely outside the production framework. **S 9.42 Equipment regulations and procedures** • Compliance with current legislation: new equipment, second-hand equipment. Periodic general checks: of machinery used for lifting loads, telehandlers, balers.				
	Comment : *Knowledge is defined with reference to the regulations in force on the date of writing of the reference system. They will evolve with these regulations*				

S10. Environmental Protection

	Technological knowledge	Levels 1 2 3 4			
S10.1 Sustainable development					
	S10.1.1 Concept, challenges of sustainable development • Concept. • Societal, economic and environmental issues, associated indicators. • Principles: Precaution, prevention, accountability. **S10.1.2 Regulations** • European and French regulations relating to the prevention of pollution of water, air, nature and waste management. • Environmental Code				
	S10.1.3 Life cycle analysis • The stages of a product's life cycle • Concept of eco-design • Concept of eco-driving • Concept of eco-maintenance				
S10.2 Environmental management					
	S10.2.1 Normalization • ISO 14000 standards. Domains and fields of application **S10.2.2 Legislation** • Legislative and regulatory aspects in terms of environmental protection and risks associated with the procedures implemented and the use of fluids, materials and components o Obligations of the company manager o Areas of application of materials, products and fluids at risk and the types of nuisance o Elementary prevention and continuous improvement actions o Environmental consequences of the choice of a solution Eco-assessment of the company's activities **S10.2.3 Institutions and regulatory bodies** • Role and missions of institutions and regulatory bodies: Agency for the Environment and Energy Management (ADEME), Regional Directorate for Industry, Research and the Environment (DRIRE), National Institute for the Industrial Environment and Risks (INERIS).				
	Observations: ***Legislation:*** *the eco-maintenance or eco-design approach is seen in parallel with the same knowledge in S6.* ***Institutions and regulatory bodies :*** *the institutions and bodies whose existence is to be known are those currently in existence. They are likely to evolve both in their name and their missions. Teaching will adapt to these changes.*				
S 10.3	**Collection, sorting, disposal of waste**				
	• Nature of waste (neutral waste, degradable waste, recyclable waste, toxic waste), quantity, harmfulness, flammability and associated nuisances • Handling of refrigerants (certificate of capacity, certificate of aptitude) • Raising staff awareness of the approach (certificate staff aptitude) • Organization of a recovery area (identification, types of storage, possible treatment before elimination or evacuation) • Methods of collection inside and outside the company and sorting of waste • Elimination, evacuation, monitoring of waste • Dismantling of end-of-life equipment				

Appendix Ic: GLOSSARY

Accessory : *Part,*

organ or instrument which, installed on a system, provides it with additional but non-essential functions.

Reflective analysis : *This*
should be the development of the teacher's levels of reflection. Being able to describe, analyze, criticize and innovate within one's approach as a teacher. The process of reflective analysis essentially comprises four stages which progress in a cyclical movement.

Driving authorization :
Article R4323-56 of the labor code
The operation of certain equipment presenting particular risks, due to their characteristics or their purpose, is subject to obtaining a driving permit issued by the head of the establishment.
The driving license is made available to the work inspector or the representative of the CRAM The head of the establishment must draw up and issue a driving license for the machine after having ensured: - medical fitness of the driver - that he has followed a theoretical and practical assessment of safe driving - that he is aware of the places and instructions to be followed on the site of use

Manufacturer or supplier database : *This is a structured resource*
of elements relating to a given domain (family of components, parts, materials, etc.) made available by the manufacturer or supplier.

These data are available on digital media residing on the company's computer network or on the Internet.
The library is structured in element families. There are several ways to search for items: keywords, index,…

Need :
Need or desire felt by a user, not by market volume. A need can be expressed or implied, acknowledged or unacknowledged, latent or potential. In all cases, it constitutes the need to be satisfied for which a user is ready to make an effort (standard NF X 50-150).

We distinguish the latent need (or expressed need, the most fundamental), identified (which results from studies: market, consumer behavior, consumption statistics) and created (often by the marketing of new products with technological innovation) .

Functional specifications : *Document by*
which the applicant expresses his needs in terms of service functions and constraints. For each of them, the assessment criteria and their levels are defined: each of these levels is accompanied by flexibility (NF X 50-150).

Document drawn up by the applicant defining the technical clauses, the quality clauses and the administrative clauses applicable to the supply sought; it serves as the basis for the supplier's proposal and may be the subject of a contract (NF X 50-151 and NF Z 61-102).

Calibration :
Action of entering a value into an electronic system, or performing a physical adjustment on a component, to target a degree of performance.

Capacity :
Set of skills that the individual uses in different situations.
A capacity retains a very general character, it is neither observable nor assessable.
It is broken down into skills that concretely translate action situations in a given context.

Field of activities : *It*
represents the professional activities (eg the relationship with the clientele), the work situations encountered and the purpose of this work.

Workshop manager :
Sector manager with technicians and operators under his responsibility, managing the organization of interventions and ensuring the link between the customer, his staff and his hierarchy.

Team leader :
Personnel reporting directly to the workshop foreman and supervising a group of technicians and/or operators.

CHSCT : *The*
Health, Safety and Working Conditions Committee. It is present in all establishments employing at least 50 employees and its mission is to contribute to the protection of the health and safety of workers as well as the improvement of working conditions.

Customer : *A customer, in the economic sense, is the buyer or lessor of a good or service on an occasional or regular basis to a supplier.*
It is necessary to distinguish the term customer from the terms "user" or "user" (used rather in public services where users do not have the choice of supplier)

Error codes :
Numerical or alphanumeric codification appearing visually on the equipment of the machine's driving position or on an independent computer tool. They inform the user and the maintenance technician of a malfunction of a component or a system. Each error code corresponds to a specific failure.

Competence (see Afnor FD X 50-183) : *Set of*
knowledge, know-how and behaviors organized with a view to performing an activity in an appropriate manner.
In a concrete situation, a skill translates into observable actions or behaviors.
The behaviors or results of the action are measurable or assessable.

Sponsor : *Person*
who orders a service.
In company law: person who finances a limited partnership and who is liable for social debts within the limit of his contribution.

Component :
Element or assembly intended to fulfill a particular function in a subsystem or a system (NF X 60-012).

Configuration : *Set*
of physical characteristics, computer and electronic equipment adapted and regulated for the operation of a system, of equipment.

Technical adviser : *Person*
recognized for his technical skills in a range of products whose function is to provide solutions to technical problems, to advise technicians and customers in the areas of maintenance and use of equipment.

Consumable : *Item*
of low cost and frequent consumption (FD X 60-000). These are unmarked products or items necessary for maintenance (Ex: oil, grease, gasket, filter, etc.)

Maintenance contract: *Contractual*
document that binds the customer to the company on equipment maintenance operations. The contract specifies: its duration, method of payment, coverage of parts and labor, duration of assistance, towing, removal, loan of replacement equipment, etc.

Sales contract: *The*
sales contract is an agreement by which one of the parties, the seller, undertakes to deliver a good and the other party, the buyer, to receive delivery and pay for it.
The sales contract generates rights and obligations between the two parties.

Control in Training Course (CCF) : *This is a*
certification assessment of a set of terminal skills, carried out by sampling as the trainees reach the required level and implemented by the teachers by associating professionals.

CUMA :
Cooperative for the Use of Agricultural Equipment. It brings together farmers who invest together in equipment and organize themselves to use this equipment on their farm.

Failure :
Alteration or ceasing of an asset to perform a required function.

Intervention time : *Duration*
before the equipment is taken over for a maintenance intervention and not the duration of the intervention (repair, maintenance).

Quality approach :
Approach in which the company engages in order to improve or maintain customer satisfaction.
The ISO 9001 2008 Standard specifies the requirements relating to the quality management system when an organization needs to demonstrate its ability to regularly provide a product that complies with customer requirements and applicable legal and regulatory requirements.
The ISO 14001 Standard specifies the requirements for environmental management.

Diagnosis :
Study or analysis of a problem, a breakdown in order to know its origin. It is based on the search for causes and effects. The diagnosis also provides for the rational approach to compliance.
The status of the diagnosis may vary: Diagnosis of good or bad operation, diagnosis of breakdown or failure, diagnosis of performance or non-performance, diagnosis of human error or human reliability.

Fault diagnosis : *Set of*
actions carried out for the detection of the fault, its location and the identification of the cause (EN 13306).

Single document (assessment of occupational risks) : *Decree No. 2001-1016 of*
November 5, 2001 provides for the obligation for all employers, regardless of the size of the company, to transcribe the results of risk assessments for the health and safety of employees in a single document. This obligation has been included in the labor code (article R230-1) which provides for penalties in the event of non-compliance (article R263-1-1). This single document should contribute to the development of a risk prevention program in order to reduce and eliminate the majority of the hazards noted.

Technical documentation : *Set of*
documents on various media, made available by a manufacturer or a supplier, or internal to the company, concerning equipment which describes its use, its technicality, its characteristics, its settings and the intervention procedures.

Satisfaction survey : *Set of*
questions and testimonials offered to customers and allowing them to measure their level of satisfaction with the services or products offered.

Equipment :
Subsystem or accessory(ies) mounted on equipment enabling it to carry out a specific function, or even to improve its performance.

Fixed workshop equipment: *Various*
tools and equipment available to technicians to assist them in maintenance, handling, inspection, lifting, wedging, removal-refitting, disassembly-reassembly, testing, etc.

Ergonomics :
Ergonomics can be defined as the science of work having as its object "the adaptation of work to man" (improvement of working conditions). It will result in the satisfaction of employees, their comfort, their health but also the efficiency of their operating conditions.

ES&ST :
Occupational Health and Safety Education

Dynamic test : *Test of*
the equipment in motion and/or by implementing some or all of its usage functions, to compare them with the manufacturer's data and thus to assess any malfunctions.

Static test: *Activity*
which makes it possible to check the operation, the characteristics of equipment when it is stopped by limiting the functions of use and thus making it possible to evaluate any malfunctions, in comparison with the manufacturer's data.

EdT :
Entrepreneurs of the Territories (ex-Entrepreneurs of Agricultural, Rural and Forestry Works.). These are service providers who, in particular, save farmers and foresters expensive investments by carrying out all work in the agricultural or forestry field in their place and thus allowing them to devote themselves to other activities without abandoning their prerogatives as managers. business.

Regulatory requirements : *Regulatory*
requirements are mandatory provisions which are the legal translation of an orientation or a will of the public authorities. Unlike standards, best practices or recommendations, these texts must imperatively apply to all economic sectors within the scope concerned.

Functions :
They are linked to the organization and structure of companies in the sector (eg after-sales technician).

Supplier of goods :

Company that provides certain goods or goods (materials, accessories, spare parts, equipment, consumables, etc.) to a user.

Flat- **rate** *sheet:*
Descriptive sheet of flat-rate operations used in additional sales (detailed description of operations, times, parts and costs).

History of a piece of equipment (tracking file) :
Chronological state of the various interventions and possible malfunctions which follows the life of a piece of equipment, from its commissioning.

Rating Indicator :
Minimum measurable or observable performance that is necessary to achieve to validate a competency

Maintenance : *Set*
of all technical, administrative and management actions during the life cycle of an item, intended to maintain it or restore it to a state in which it can perform the required function (EN 13306). Maintenance can be corrective (palliative or curative) or preventive (conditional or systematic).

Curative maintenance : *It*
allows restoring a piece of equipment or an entity to a specified state or allowing it to perform a required function.
The result of the activities carried out must be permanent.

Preventive maintenance :
Maintenance carried out at predetermined intervals or according to prescribed criteria and intended to reduce the probability of failure or degradation of the functioning of an item (EN 13306).

Hardware :

System that can use several technologies to meet a production function.

Nomenclature : *A*
nomenclature is an exhaustive list of all the elements (represented on the plans, diagrams, notices) which constitute the set or the subset in which they are included.

Standard :
Technical text concerning products or processes, established by agreement between manufacturers, users (industrialists or consumers), public authorities, scientific personalities. A standard is a reference published by a standardization body such as AFNOR.

Technical note :
Communication specific to the company on various supports which informs about a technicality specific to a material and which specifies degrees of intervention.

Repair order or work order : *Contractual document*
binding the company and the customer. It defines the nature and conditions of the work to be performed. Signed by both parties, it initiates the intervention procedure on the equipment and the reciprocal legal obligations.

Certifying body : *Body giving*
written assurance that a product, process, service and/or people's skills comply with the requirements set out in a reference system, after having carried out audits, tests, examinations and any other activity. monitoring.

Support tools for additional selling :
Questionnaires, procedures, nomenclatures, which help to identify customer needs and participate in additional selling.

Tools : *Set*
of tools (e.g. torque wrench, screwdriver, etc.) or devices (e.g. diagnostic tool) which are available to a technician for a given activity and which can permanently equip a workstation (e.g. : test bench).

Settings : *Set of*
mechanical settings and values to be entered on the on-board system or via the independent computer tool in order to adapt and optimize the operation of the equipment to its use.

Discovery plan: *The*
discovery plan is a questioning plan used to prepare for and carry out a sales interview.
Its purpose is to discover the nature of the need and the motivations of the client. It therefore makes it possible to determine the commercial proposal or the product to be offered, but also to choose the arguments capable of convincing the customer.

Planning of interventions : *Table representing the schedule forecast for a set of personnel. It makes it possible to plan and optimize the interventions of the teams of technicians.*

Pre-diagnosis: *Prior identification of the nature of the malfunction of a piece of equipment by observing the symptoms, by carrying out orientation tests, simple and rapid checks and measurements without removal and by interpreting the descriptions given by the user. These operations will allow the technician to choose a diagnostic method.*

Prescriber : *A prescriber is a person whose activity is in a position to recommend the purchase of a product, brand or service.*

Service provider : *Contracting party (organization, joint venture, etc.) having agreed to assume the responsibility for providing a given maintenance service and obtaining supplies, when specified, in accordance with a contract (European standard EN 13269 : 2006) signed with a client.*

Procedure : *In ISO 9001 – 2008, a procedure is defined as a specified way of accomplishing a sequence of operations, activity or process. A procedure generally responds to requirements that are not debatable by the operator who applies them.*

Performance control procedure : *Document from the manufacturer or the company which chronologically specifies all the rules to be applied, the different stages to be observed, the operations to be carried out with the help, or not, of control tools and measurements in order to check the performance of the equipment in comparison with the manufacturer's data and to detect any malfunctions.*

Process : *Set of correlated or interactive activities which transform input elements into output elements which can be either material objects, or information or even both.*

Process for validating an intervention (which incorporates performance monitoring procedures) : *A continuous sequence of precise and observable operations, containing indicators, which constitutes the way of validating an intervention.*

Phytotechnical production : *Set of techniques and means that lead to the maturation stage of cultivated plants.*

Zootechnical production : *This is the set of techniques and means implemented in the breeding of animals to obtain products or services for humans.*

Quality :

Set of properties and characteristics of a product or service which give it the ability to satisfy expressed or implicit needs (standard NF X 50-120 or ISO 8402). Ability of a set of intrinsic characteristics to satisfy requirements (ISO 9000: 2005 standard).

Repository of professional activities (RAP) : *The RAP is the founding document of the diploma. It describes the professional activities that the graduate will be called upon to perform after a period of adaptation in the company. It is always designed with expert professionals in the field studied.*

Certification reference system (RC) : *The certification reference system for the professional field brings together the capacities, skills, know-how and knowledge necessary for obtaining the diploma.*

Regulations : *Set of rules and laws concerning a domain. Examples: The Highway Code: Set of official rules governing road traffic, The Labor Code: It lists all the provisions constituting labor regulations (laws and decrees) in the same collection.*

The Environmental Code: Rules governing the protection of natural heritage

Associated knowledge: (Afnor FD X 50-183) *It is a theoretical knowledge that it is necessary to mobilize to implement a skill.*

Know-how : *It is the implementation of knowledge and a practical skill mastered in a specific situation (AFNOR).*

Graphic communication media : *One of the most effective methods for presenting the operation of a system or the evolution of a sector by indicators consists in using graphs and tables. The visual display of graphic tools facilitates reading and comparison. They make it possible to understand and argue a state, a trend, a decision. (e.g. diagram, table, diagram, flowchart, flowchart, algorigram, chronogram, functional graph, etc.).*

Embedded systems :
Integrated electronic and computer resources used for the management of the equipment and for dialogue with the user or the technician on the state of operation of the latter, its degree of exploitation, and its possible malfunctions.
Embedded systems can be configured, reset or even consulted remotely.

Workshop management dashboard : *All of the statistical and graphic information used to monitor the operation of the workshop (hourly, daily or weekly occupation of technicians and workstations in the company's workshops) and to easily detect any not qualities. Useful management tool for taking stock of activity.*

Tasks :
They describe what the person does from the perspective of what is expected in a specific organization (eg: taking care of the customer or user, carrying out a pre-diagnosis). They are classified by function or activity.

Technician :
Qualified professional with a degree of autonomy enabling him to implement the means made available to him to carry out maintenance, repair or adaptation work on equipment. He may have operators under his responsibility and himself be supervised by a senior technician.

After-sales technician : *Qualified professional who masters the technique of equipment, the company's commercial procedures and legislation. He is able to inform and advise the client. He may be required to carry out his activities in the workshop, in the offices of the agency or in the field.*

Test :
Control technique consisting of ensuring that the characteristics and settings of a piece of equipment comply with pre-established data.

Orientation tests : *All visual, auditory, tactile and olfactory checks, carried out without a device, allowing the technician to orient his diagnosis.*

Upselling : *Upselling is a sales technique by which a seller takes advantage of the sale or the interest shown by a buyer for a given product to offer and sell a complementary product or a product superior to the product initially acquired or targeted by the buyer.*

APPENDIX II

CERTIFICATION TERMS

APPENDIX II a: diploma components.

Skill implemented and assessed							
	C 1.1	Get informed				■	
	C 1.2 Listen to the customer, dialogue and negotiate a solution C1 Communicate						■
	C 1.3 Present					■	
C2 Analyze	C2.1	Interpret data		■			
	C2.2	Analyze a technical maintenance or adaptation situation	■				
	C2.3 Analyze an agro-technical situation			■			
	C2.4	Analyze a legal, economic and managerial situation			■		
	C2.5 Analyze a technical system			■			
C3 Propose	C3.1 Look for or imagine solutions						■
	C3.2 Choose a solution						■
	C3.3 Encrypt a solution				■		
C4 Organize	C4.1	Manage equipment and workstations	■				
	C4.2 Plan and manage operations					■	
C5 Perform	C5.1	Implement equipment, measurement or diagnostic tools, a procedure	■				
	C5.2	Develop a procedure, an after-sales service process					■
	C5.3	Carry out tests, settings, apply procedures	■				
	C5.4	control, validate, an intervention, a method, a procedure	■				
C6 Prevent	C6.1	Take into account the environmental impact of the company's activity					■
	C6.2	Advising a client on the use of his equipment which respects the environment		■			
	C6.3	Define and implement occupational risk prevention measures				■	

APPENDIX II b: common units

U1. GENERAL CULTURE AND EXPRESSION

Candidates for the examination of a higher technician certificate specialty, holders of a higher technician certificate of another specialty, a university diploma in technology or a national diploma of level III or higher are, at their request, exempted from taking the “General culture and expression” unit.

Beneficiaries of the “French”, “French Expression” or “General Culture and Expression” unit under another BTS specialty are, at their request, during the period of validity of the benefit, exempted from the corresponding tests. in unit U1 “General culture and expression”.

U2. ENGLISH

The U2 unit. “English” of the higher technician patent Design and production of bodywork and the unit of “Foreign living language 1” of the higher technician patents falling under the decree of July 22, 2008 (BOESR n ° 32 of August 28, 2008) are common provided that the candidates have chosen English.

Beneficiaries of the “Modern foreign language” unit under one of the aforementioned specialties are, at their request, exempted from the U2 “English” unit, provided that the candidates have chosen English.

Holders of one of the above-mentioned specialties who wish to apply for another of these specialties are, at their request, exempted from undergoing the U2 unit: “English” or “Foreign living language 1” subject, in the latter case, that the candidates have chosen English.

On the other hand, holders of a national diploma of level III or higher, having been assessed in English to obtain this diploma, are, at their request, exempted from taking the U2 unit. : “English” of the higher technician certificate Design and production of bodywork.

U 31. MATHEMATICS

The U3 unit. "Mathematics" of the higher technician certificate Design and production of bodywork and the Mathematics unit of the higher technician certificates of group C are common.

Beneficiaries of the Mathematics unit under one of the above-mentioned specialties who wish to apply for another of these specialties are, at their request, during the period of validity of the benefit, exempted from undergoing the unit of Math.

On the other hand, holders of a national scientific or technological diploma of level III or higher, having been assessed in Mathematics to obtain this diploma, are, at their request, exempted from undergoing unit U3. “Mathematics” of the higher technician certificate Design and production of bodywork.

APPENDIX II c: EXAMINATION REGULATIONS

EVENTS			Schools (public or private establishments under contract) Apprentices (CFA or authorized apprenticeship sections), Continuing vocational training in authorized public establishments		Continuing vocational training (public establishments authorized to practice CCF for this BTS)	Schools (private establishments not under contract), Apprentices (CFA or apprenticeship sections not authorized), Continuing vocational training (private establishment) Based on their professional experience Distance Learning	
Nature of the tests	***Unit Coef Form***			***Duration***	***Shape***	***Shape***	***Duration***
E1 – General culture and expression	**U1**	2	Punctual written	4h	CCF 3 situations	Punctual written	4h
E2 – English	**U2** 2		CCF 2 situations		CCF 2 situations	Punctual oral	Comprehension : 30 min without preparation; Expression: 15 min + 30 min of preparation
E3 – Mathematics – Applied physical and chemical sciences		4					
Subtest: Math	**U31**	2	Punctual written	2 hours	CCF 2 situations	Punctual written	2 hours
Subtest: Applied physical and chemical sciences	**U32**	2	CCF 2 situations		CCF 2 situations	Punctual practice	2 hours
E4 – Diagnosis or implementation	**U4 3**		CCF 1 situation		CCF 1 situation	Punctual practice	3h
E5 – Agro-technical case study		6					
Subtest: Agro technical analysis	**U51**	4	Punctual written	4h	CCF 2 situations	Punctual written	4h
Subtest: Legal, economic and managerial analysis	**U52**	2	Punctual written	2 hours	CCF 1 situation	Punctual written	2 hours
E6 – Professional summary test		7					
Subtest: Activities in the workplace	**U61**	2	Punctual oral	30 mins	Punctual Oral (30 mins)	Punctual oral	30 mins
Subtest: Project	**U62**	5	Punctual oral	1 hour	Punctual Oral (1h)	Punctual oral	1 hour
EF1: Optional language test	**UF1**		Punctual oral	20 mins (+ 20 mins preparation)	Punctual oral	Punctual oral	20 mins (+ 20 mins of preparation

*: Excluding English (for this optional test, only points above the average are taken into account).

ANNEX IId

DEFINITION OF TESTS AND EVALUATION SITUATION

Test E1 GENERAL CULTURE AND EXPRESSION
U1
Factor 2

1 – OBJECTIVE OF THE EVENT

The aim is to certify candidates' ability to communicate effectively in everyday life and in professional life.

The purpose of the assessment is therefore to verify the candidate's ability to: take advantage of the documents read during the year and the reflection carried out during the course; report on a culture acquired during training; appreciate a message or a situation; communicate in writing or orally; apprehend a message; make a message. *(see appendix III of the decree of January 17, 2005 – BO n° 7 of February 17, 2005.)*

2 - FORMS OF ASSESSMENT

2.1 - Specific form *Written test, duration 4* hours Three to four documents of a different nature are proposed (literary texts, non-literary texts, iconographic documents, statistical tables, etc.) chosen with reference to one of the two themes included in the program of the second year of STS. Each of them is dated and placed in its context.
First part: summary (marked out of 40)
The candidate writes an objective summary by comparing the documents provided.
Second part: personal writing (marked out of 20)
The candidate responds in a reasoned way to a question relating to the proposed documents. The question asked invites to compare the documents proposed in summary and the studies of documents carried out in the current year of “General culture and expression”.

The overall score is reduced to a score out of 20 points.
(see appendix III of the decree of January 17, 2005 – BO n° 7 of February 17, 2005.)

2.2 - Control during training The “General culture and expression” unit consists of three evaluation situations of identical weight: – two situations relating to the evaluation of the candidate's ability to understand and carry out a written message ; – a situation relating to the candidate's ability to communicate orally assessed during the defense of the report of activities in a professional environment.

First evaluation situation (indicative duration: 2 hours):

a) General objective: Assessment of the candidate's ability to understand and produce a written message. b) Skills to be assessed: Respect the constraints of the written language; Synthesize information: fidelity to the meaning of the documents, accuracy and precision in their understanding and their linking, relevance of the choices made according to the problem posed and the problem, consistency of production (classification and sequence of elements, balance of parties, density of the subject, effectiveness of the message).

c) Example of a situation:
Creation of a synthesis of documents from 2 to 3 documents of a different nature (literary texts, non-literary texts, iconographic documents, statistical tables, etc.) each of which is dated and placed in its context. These documents refer to the second theme of the program of the second year of STS.

Second assessment situation (indicative duration: 2 hours): a)
General objective: Assessment of the candidate's ability to understand and produce a written message.
b) Skills to be assessed: Respect the constraints of the written language; Respond in a reasoned way to a question asked in relation to the documents offered for reading.

c) Example of situation:
Based on a file given to be read in the days preceding the evaluation situation and composed of 2 to 3 documents of a different nature (literary texts, non-literary texts, iconographic documents, statistical tables, etc. .), linked by an explicit problem with reference to one of the two themes included in the program of the second year of STS and in which each document is dated and placed in its context, writing of a reasoned answer to a question relating to the file issue.
This situation is scored out of 20 points. The overall score is reduced to a score out of 20.

Third assessment situation (integrated into test E61: *Activities in a professional environment) :* a)
General objective: Assessment of the candidate's ability to communicate orally. b) Skills to be assessed:
Adapt to the situation (mastery of the constraints of time, place, objectives and adaptation to the recipient, choice of appropriate means of expression, consideration of the attitude and questions of the interlocutor(s); Organize an oral message: respect for the subject, internal structure of the message (intelligibility, precision and relevance of ideas, value of the argument, clarity of the conclusion, relevance of the answers, etc.). c) Example of situation The candidate's ability to communicate orally is assessed at the time of the presentation of the internship report.

Each situation is scored out of 20 points. The overall score is reduced to a score out of 20.

E2 ENGLISH test

U2

Factor 2

1. PURPOSES AND OBJECTIVES

The purpose of the test is to assess the following language activities **at level B2 :**
a) Listening comprehension, b) Oral production and interaction.

2. FORMS OF ASSESSMENT

2.1. Punctual form The
procedures for taking the test, the definition of the length of the recordings and the nature of the supports for listening comprehension as well as the coefficient are identical to those of the control during training.

1. ***Listening comprehension :*** *30 minutes without preparation.* Methods: See First CCF assessment situation below *2.* ***Continuous and interactive oral expression :*** *15 minutes with 30 minutes of preparation time.* Terms: See Second assessment situation of the CCF below

2.2. Control during training: two evaluation situations of equivalent weight.

First assessment situation: ***assessment of listening comprehension*** – duration 30 minutes maximum without preparation, during the second term of the second year.

Organization of the event :
The teachers organize this evaluation situation during the second trimester, when they judge that the students are ready and on the supports that they select. This evaluation situation is

formally organized for each student or for a group of students according to the pace of acquisition in any case before the end of the second term. The grades obtained are not communicated to the students and no resiting is planned.

Taking the test : The title
of the recording is communicated to the candidate. We will ensure that it does not present any particular difficulty.

Three listenings spaced 2 minutes apart of an audio or video document which the candidate will report in writing or orally in French.

Record length :
The duration of the recording will not exceed three minutes maximum. The use of authentic documents sometimes requires the selection of slightly longer extracts (hence the upper limit set at 3 minutes) so as not to proceed with the cutting of certain elements which facilitate understanding more than they complicate it. .

The teacher can also choose to evaluate the students from two documents. In this case, the length will not exceed 3 minutes for the two documents and care will be taken that they are of a different nature: dialogue and monologue.

Type of media :
The recorded documents, audio or video, will be of a nature to interest an STS student without however being excessively technical. We can cite, by way of example, documents relating to employment (research, recruitment, professional relations, etc.), safety and health at work, life in the company; vocational training, the consideration by industry of issues relating to the environment, sustainable development, etc. It may be monologues, dialogues, speeches, discussions, radio broadcasts, extracts from documentaries, films, television news.

It will not be in any way oral writing or recordings from textbooks.
Press articles or any other document designed to be read should be avoided. Indeed, the latter, because they are written in a written language, considerably complicate the task of the listener. Moreover, the understanding of a recorded article does not correspond to any situation in professional life.

Second assessment situation: assessment of continuous oral production and interaction during the second and third terms of the second year (duration 15 minutes maximum + 30 minutes of preparation) :

1. Continuous oral expression: personal presentation of the candidate, and presentation of the documents that will have been given to him in the box (approximately 5 minutes)
This test is based on two or three appropriate textual and iconographic documents illustrating a theme suitable for industrial sections. All of the written documents, including the texts accompanying the iconographic documents (photo or drawing captions, advertising slogans, etc.) will not exceed 250 words. The iconographic documents will only represent at most one third of the file.
The candidate will link a brief personal presentation (approximately one or two minutes) and a structured presentation of the documents (approximately three or four minutes) highlighting the theme they illustrate and underlining the important points and relevant details (cf. definition of the level B2 Common European Framework of Reference for continuous oral production). This part of the test will last approximately 5 minutes

2. Oral expression in interaction (about 10 minutes)
During the interview that will follow, the examiner will endeavor to allow the candidate to clarify certain points, to address others that he may have omitted. This part of the test will last approximately 10 minutes.

Each situation is scored out of 20 points. The overall score is reduced to a score out of 20.

Paper E3: Mathematics – physical sciences

U31: MATHEMATICS

Factor 2

1 – OBJECTIVE OF THE UNDER TEST

The purpose of this test is:

to assess the solidity of the candidates' knowledge and their ability to mobilize them in a variety of situations; to check their ability to reason and their ability to correctly analyze a problem, to justify the results obtained and to assess their scope; to assess their qualities in the field of written expression and the performance of various tasks

2. CONTENT OF THE SUB-TEST

The content of this sub-test makes it possible to assess the candidates' abilities to:

possess the knowledge appearing in the programme; use sources of information; find a suitable strategy for a given problem; implement a strategy: implement mathematical know-how specific to the specialty; argue ; analyze the relevance of a result. communicate in writing or even orally.

3. METHOD OF ASSESSMENT

3.1. Occasional form: Written test lasting 2 hours.

The topics include two math exercises. These exercises will relate to different parts of the program and must remain close to professional reality.

The test relates both to direct applications of the knowledge of the course and to their mobilization within more global problems.

Any theoretical difficulty and any excessive mathematical technicality should be avoided. The length and breadth of the topic should allow an average candidate to cover the topic and write it calmly in the time available.

The use of calculators during the test is defined by circular n° 99-018 of 1-2-1999 (BO n° 6 of February 11, 1999).

At the top of the subjects must appear the following two

- reminders: the clarity of the reasoning and the quality of the writing will play an important part in the assessment of the copies, • the use of calculating instruments and the official form of mathematics is authorised.

3.2. Control during training It includes

two evaluation situations, each counting for half of the coefficient attributed to the mathematics sub-test.

First evaluation situation, located in the second part, respects the following points: 1. this evaluation is written and its duration is close to that corresponding to the one-off evaluation of this BTS.

2. this evaluation situation includes mathematical exercises covering a very large part of the program. In each specialty, the mathematical themes they bring into play relate mainly to the most useful chapters for the other lessons.
3. The number of points allocated to each exercise is indicated to the candidates so that they can manage their works.

4. When these situations are based on other disciplines, no knowledge relating to the disciplines considered is required of the candidates for the assessment of mathematics and all useful explanations and indications must be provided in the statement.
5. the evaluation situation allows the direct application of the knowledge of the course but also the mobilization of these within more global problems.
6. All theoretical difficulty and excessive mathematical technicality should be avoided.
7. The length and breadth of the topic should allow an average candidate to cover the topic and understand it. Write calmly in the allotted time.
8. The use of calculators during this assessment situation is defined by the regulations in force for national education examinations and competitions.
9. The two following points must imperatively be reminded to the candidate:
   the clarity of the reasoning and the quality of the writing will play an important part in the assessment of the copies; the use of calculators and the official mathematics form is authorized.

Second evaluation situation, located at the end of the training, respects the following points:

The second assessment situation is the written achievement (individual or in a small group) and the oral presentation (individual) of a file comprising the implementation of mathematical know-how in direct connection with the present specialty of BTS.
During the oral, which lasts a maximum of twenty minutes, the candidate will be required to answer questions directly related to the mathematical content of the dossier.

Paper E3: Mathematics – physical sciences

U32: APPLIED PHYSICAL AND CHEMICAL SCIENCES

Factor 2

1 – OBJECTIVE OF THE UNDER TEST

The purpose of the assessment in applied physical and chemical sciences is to:
to assess the solidity of the candidates' know-how and to ensure their ability to carry out measurements on devices related to professional activities; to check their knowledge of the scientific equipment and the conditions of its use; to check their ability to obtain information and express themselves in writing on a scientific subject.

2. CONTENT OF THE SUB-TEST

The content of the sub-test must respect the following points: each
evaluation situation is experimental; each evaluation situation
must make it possible to evaluate the experimental know-how – knowledge or theoretical know-how related to the experimental situation can also be evaluated – their share must not exceed 25% of the mark; the contents covered have as their starting point professional situations related to the definition of the unit; the length and breadth of the subject must allow an average candidate to deal with the subject and write his answer calmly in the time allowed; the use of the computer tool (acquisition, plotting of curves, modelling, simulation) is strongly recommended. It is quite possible that the candidate provides a computerized document as a copy.

3. ASSESSMENT

The evaluation will take the greatest account of the mastery in the conduct of the manipulations and in the drafting of the report, of the compatibility of the precision of the numerical results with that of the data of the statement, that of the measuring devices used, of the care given to possible graphic representations and the quality of the French language in its scientific use.

4. METHOD OF ASSESSMENT

4.1. Punctual form
Practical test lasting 2 hours.
The constitution of the subject is defined in chapter 2 "Content of the test" above.

4.2. Control during training The
evaluation is carried out on the basis of two evaluation situations defined in the content of this test.
Each one lasts 2 hours and is scored out of 20 points. These two assessment situations are organized by the teaching team responsible for teaching Applied Physical and Chemical Sciences. The periods chosen for these two assessments, located during the second half of the training, may be different for each of the candidates. The organization of these assessments is the responsibility of the teaching team.

The final mark out of 20 proposed to the evaluation committee for the unit is the average, rounded off to half a point, of the marks resulting from the two evaluation situations.

Test E4: DIAGNOSIS OR IMPLEMENTATION

U4
Factor 3

1 – PURPOSE OF THE EVENT

The purpose of this test is to validate all or part of the following skills in the reference system:

• C2.2: Analyze a technical maintenance or adaptation situation • C4.1: Manage equipment and workstations • C5.1: Implement equipment, measurement or diagnostic tools, a procedure • C5.3: Carry out tests, settings, apply procedures • C5.4: Check, validate, an intervention, a method, a procedure

The performance indicators are those defined in the certification reference system and relating to the skills to be assessed.

It should be noted that to perform the tasks requested, certain other skills may be mobilised.
Under no circumstances will these give rise to an evaluation. If these skills are not mastered, the corresponding tasks must be performed with assistance.

While it is clearly understood that the implementation of the skills to be assessed requires the mobilization of the corresponding knowledge, there can be no question of evaluating the knowledge alone.

2 CONDITIONS OF REALIZATION

The support for the event is **professional equipment** (machine, tool, equipment, simulator, etc.) from agricultural equipment. It is as recent as possible and uses current technologies.
The technical documentation of this material is provided.
Diagnostic or control aid tools are available.

The candidate is placed in a situation of execution of all or part of the tasks 2T1, 2T2, 2T3, 3T1, 3T2, 3T4, 3T5, 4T3 and 7T2 relating to activities A2, A3, A4 and A7.

The test therefore essentially consists of either a **situation of diagnosis** of a malfunctioning piece of equipment, or a **situation of implementation** of a piece of equipment.

3 - EVALUATION METHODS

3.1 - Occasional form: practical test - maximum duration of 3 hours -

This test consists of putting the candidate in a position to perform all or part of the professional tasks indicated in 2.

For candidates from centers not authorized to practice the CCF, the test takes place in their center. The evaluation commission is made up of two SII professors working in an approved centre.

For isolated candidates, the test takes place in a public establishment with a senior technician section in Techniques and Services in Agricultural Equipment. The evaluation committee is made up of two SII professors from the establishment.

3.2 – Control during training: - maximum duration of 3 hours –

An evaluation situation, organized during practical work activities, This situation consists of putting the candidate in a position to perform all or part of the professional tasks indicated in 2.

The period chosen for the assessment, located during the second semester of the second year of training, may be different for each of the candidates. The organization of this assessment is the responsibility of the teaching staff.

4 - EVALUATION

A national evaluation sheet for the work carried out for this test, drafted and updated by the General Inspectorate of National Education, is distributed to establishments by the rectoral services for examinations and competitions. It must be used, to the exclusion of any other, both for candidates coming under the one-off test and for those coming under the control during training.

At the end of the test or the assessment situation, the assessment committee compiles a file for each candidate including:

- all the documents submitted to carry out the work requested; any
- documents produced by the candidate; the completed national
- evaluation sheet that allowed the grade proposal.

This form must be sent to the jury. The entire file described above, relating to the evaluation situation, is made available to the jury and the rectoral authority until the following session. The jury may possibly require it to be sent before deliberation in order to consult it. In this case, following an in-depth examination, he will formulate all the remarks and observations he deems useful and will approve the note.

Event E5: CASE STUDY IN AGRI-EQUIPMENT

Factor 6

The E5 test consists of two sub-tests including a simulation common.

U51: agro-technical analysis - U52: legal, economic and managerial analysis

FINALITY OF THE E5 EVENT

Starting from the need stated by one or more clients and from documents setting out the situation of the problem posed, the case study must lead the candidate to analyze a situation from an agrotechnical and legal and economic point of view. To this end, it will take into account : • agronomic data (for example: region, soils, crops, etc.) • organizational data (for example: layout, people, operating constraints, etc.) • technical data (for example: materials, level of equipment, operating policy, etc.) • regulatory data (eg: labor code, environment code, highway code, etc.) • economic data (eg: miscellaneous costs, financing, investment, …)

The test is divided into two sub-tests: E51: Agrotechnical analysis and E52: Legal, economic and managerial analysis. The E52 subtest takes place after E51.

The subjects of the two sub-tests include a common introduction defining the technical, agronomic, legal and economic context of the case study. This introduction should allow

candidates taking only one of the sub-tests to understand the sub-test presented in its overall context.

U51: AGROTECHNICAL ANALYSIS

1 - PURPOSE OF THE SUB-EVENT :

The purpose of the subtest is to validate all or part of the following skills: • C2-1: interpreting data • C2-3: analyzing an agrotechnical situation • C2-5: studying a technical system • C6-2: advising a customer for an environmentally friendly use of its equipment.

The evaluation indicators are those of the skills evaluated among those mentioned above. It should be noted that to perform the tasks requested, certain other skills may be mobilised. Under no circumstances will these give rise to an evaluation. While it is clearly understood that the implementation of the skills to be assessed requires the mobilization of the corresponding knowledge, there can be no question of evaluating the knowledge alone.

2 – CONDITIONS OF REALIZATION :

The support of the test is a file from the agro-technical field. It relates to a multi-technical material or equipment. The technical documentation provided will come from that of the manufacturer, the equipment distributor or research and publication organisations.
A problem in relation to this file is clearly stated. All the questions asked must allow the candidate to answer this problem with a matter-energy-information and environmental approach. The independence of the questions should be encouraged as much as possible.
In addition to the common introduction, the file includes all the resource elements necessary for the agro-technical analysis.

The candidate is placed in a problem solving situation related to all or part of the tasks 2T1, 2T3, 3T4, 3T5, 7T1 and 7T2 relating to activities A2, A3 and A7.

3 – EVALUATION METHODS: Occasional form

Written test - Duration 4 hours
Factor 4

U52: LEGAL, ECONOMIC AND MANAGERIAL ANALYSIS

1 - PURPOSE OF THE SUB-EVENT :

The purpose of the sub-test is to validate all or part of the skills:
• C2.4: analyze a legal, economic and managerial situation • C3.3: quantify a solution

The evaluation indicators are those of the skills evaluated among those mentioned above. It should be noted that to perform the tasks requested, certain other skills may be mobilised. Under no circumstances will these give rise to an evaluation. While it is clearly understood that the implementation of the skills to be assessed requires the mobilization of the corresponding knowledge, there can be no question of evaluating the knowledge alone.

2 – CONDITIONS OF REALIZATION :

The support of the test is a file from the agro-technical field. It relates to a multi-technical material or equipment. The technical documentation provided will be that of the manufacturer, equipment distributor or research and publication organisations.

This sub-proof must make it possible to verify the candidate's ability to analyze the legal and economic consequences in relation to the problem of sub-test E51.
In addition to the common introduction, the file includes all the resource elements necessary for the legal and economic analysis.

The candidate is placed in a problem solving situation related to all or part of the tasks 1T4, 6T2, 7T1 and 8T3 relating to activities A1, A6, A7 and A8.

3 – EVALUATION METHODS: Occasional form

Written test - Duration 2 hours
Factor 2

E6 test PROFESSIONAL SYNTHESIS TEST

Factor 7

The E6 test consists of two sub-tests U61 and U62.

U61: ACTIVITIES IN THE PROFESSIONAL ENVIRONMENT (INTERNSHIP REPORT)

1 - PURPOSE OF THE SUB-EVENT :

This sub-test concerns the candidate's ability to take advantage of the time spent in a company. The objective is to understand all the activities carried out by the candidate as part of the internship, both in the technical part and in that of customer relationship management and work organization.
It validates all or part of the following skills: C1.1: Obtaining information C1.3: Presenting C4.2: Planning and managing operations C6.3: Defining and implementing occupational risk prevention measures Indicators assessment are those of the skills assessed among those mentioned above.

2 – CONDITIONS OF REALIZATION :

The sub-test is based on an internship report written by the candidate. The internship in a professional environment takes place at the end of the first year of training (CF appendix III b).

The internship report includes:

- a **presentation of the internship site** limited to a contextualization allowing to understand the activities carried out by the candidate.
- a **case study describing a** complete process in the field of agro-technical relating to a material or an organization. This case study makes it possible to evaluate competences C4.2 and C6.3 in a privileged way.

  Note1 – For this case study, the professional documentation will be included in the appendix. The stages of each process will be described as an observer or as an actor and with a critical analysis taking into account the type of process presented.

  Note 2 – For this case study, it could for example be :

• At a dealership, the management of equipment for intervention of the management customer charge until the equipment is returned;
• At a manufacturer, quality monitoring of equipment; • In a CUMA or in an EdT (ex ETARF) **with integrated maintenance service,** planning of the use of equipment and maintenance management. • Where applicable, within an independent organization or a local authority, the establishment of an advisory policy on the use of agricultural equipment, in particular on the prevention of occupational risks.

Note 3 – For this case study, whatever the type of company, the prevention of professional and/or environmental risks will necessarily be taken into account in the **grid of activities carried out** in the company(ies) taken from the educational appendix linked to the internship agreement (CF appendix IIIc), the apprenticeship or professionalization contract. - an **internship certificate** with the tutor's assessment. For apprentices, the internship certificates are replaced by a photocopy of the employment contract or by a certificate from the employer confirming the candidate's status as an apprentice in his company. For candidates in a situation of improvement and for candidates who present themselves on the basis of their professional experience, the internship certificate may be replaced by one or more work certificates attesting that the person concerned has been employed in the field of Techniques and Services. in Agricultural Equipment, as a full-time employee for six months during the year preceding the examination or part-time for one year during the two years preceding the examination. The activities carried out must be consistent with the requirements of the reference system.

The activities carried out in a professional environment are carried out independently or under the responsibility of the tutor. The tasks described in the report were experienced by the candidate as an actor for at least one of them.

The candidate is placed in a situation of execution or observation of all or part of the tasks 1T1, 1T2, 1T3, 1T4, 2T1, 2T2, 3T1, 3T2, 3T3, 3T4, 3T5, 4T1, 4T2, 4T3, 5T2, 6T3 , 7T1, 7T2, 8T1 and 8T4 relating to activities A1, A2, A3, A4, A5, A6, A7 and A8.

The report does not exceed 40 pages, including annexes. For candidates in initial and continuing training, assistance in writing the report and preparing the defense are provided by teachers or trainers from General Culture and Expression, SII and STMG.

This report is transmitted according to a procedure set up by each academy. The compliance check of the report is carried out according to methods defined by the academic authorities before the interrogation. The finding of non-compliance of the report entails the attribution of the mention “not valid” to the corresponding test. The candidate, even present on the date of the test, cannot be questioned. Consequently, the diploma cannot be issued to him.

The non-compliance of the report may be pronounced when one of the following situations is observed : - absence of filing of the report; - submission of the report to the training center authorized to submit it beyond the date fixed by the circular organizing the examination or by the organizing authority; - absence of one of the components of the report.

If, on the day of the interrogation, the commission has a doubt about the conformity of the report, it nevertheless questions the candidate. The awarding of the mark is reserved pending a new verification implemented according to the procedures defined by the academic authorities. If, after checking, the report is declared non-compliant, the mention "not valid" is brought to the test by the president of the jury.

3 – EVALUATION MODES: Point form

A: Candidates from school, apprenticeship

- **Occasional test:** oral lasting a maximum of 30 minutes.
- **Coefficient** 2.

The test takes place in advance, at the latest **before the end of January** preceding the exam session. The date is set by the academy responsible for the inter-academic grouping.

The internship reports are submitted by the candidates to their training center on the date of the end of registration for the exam and made available to the examination committees fifteen days before the start of the test.

The test is divided into two parts:

- **First part: Defense of the internship report by the candidate before the interrogation commission: maximum duration 15 min.**

  This part allows the candidate to present the professional environment where the internship took place as well as the activities including the case study describing the process he experienced or observed, with a reflective analysis. It uses modern presentation techniques. During this part, the candidate is not interrupted by the interrogation commission.

- **Second part: Interview with the interrogation commission: maximum duration 15 min**

  At the end of the previous part of the test, the commission, which has carried out an in-depth examination of the report, engages in a dialogue with the candidate to: • assess the candidate's ability to respond with relevant arguments to questions asked in relation to the report and its defence;
  • deepen certain aspects of the activities carried out and insufficiently valued in the written dossier and oral presentation.

The inquiry committee is made up of:
• two SII professors involved in STS Techniques and Services in Agricultural Equipment, • a professional,
In the event of absence of the representative of the profession, the commission can validly carry out its task of evaluation.

The members of the questioning committee and the teaching team use the national evaluation grids.

B: Non-academic applicants

- **Specific test:** oral lasting 30 minutes.
- **Coefficient** 2.

The test takes place at the end of the second school year. The date is set by the academy responsible for the inter-academic grouping.
The internship reports are submitted by the candidates to the organizing academy on the date of the end of registration for the exam and made available to the commissions fifteen days before the start of the test.

The test takes place under the same conditions as for school, apprenticeship and continuing education candidates.

4 - EVALUATION

The evaluation sheet for the work carried out, drawn up and updated by the General Inspectorate of National Education, will be distributed to the establishments by the rectorial services for examinations and competitions.

U62: PROJECT

1 - PURPOSE OF THE SUB-EVENT :

The purpose of the sub-test is to verify the candidate's ability to lead a project approach, demonstrating autonomy and initiative. It allows in a professional situation to validate all or part of the following skills: - C1.2: Listen to the customer, dialogue and negotiate a solution, - C3.1: Look for or imagine solutions, - C3.2: Choose a solution ; - C5.2: Develop a procedure, an after-sales service process,

- C6.1: Take into account the environmental impact.

The evaluation indicators are those of the skills evaluated among those mentioned above.

2 – CONDITIONS OF REALIZATION :

The subtest is based on a project, limited to 120 hours, carried out during the second year of training. The study themes, which are the subject of the candidates' projects, are presented by the professors or trainers during an inter-academic validation commission chaired by an IA-IPR. They are presented using official documents.

The subject of study is chosen in conjunction with the environment outside the establishment or training center: dealers, manufacturers, suppliers, independent organisations.

It can deal, for example,
with: • an equipment adaptation project, • an
agricultural equipment advisory action, • the
organisation, implementation and follow-up of preventive maintenance or corrective
action, • the development of a promotional sale, • the
implementation and monitoring of an after-sales service organization policy, • etc…

Depending on its complexity, a theme can be treated by one or more candidates.

The candidate is placed in a situation of execution of all or part of the tasks 1T5, 1T6, 3T1, 3T2, 3T3, 4T4, 5T1, 6T1, 6T2, 7T1, 7T3, 8T1, 8T2, 8T3 and 8T4 relating to activities A1, A3 , A4, A5, A6, A7 and A8.

The test is based on a file including the validation sheet for the theme issued by the inter-academic validation committee, the file compiled by the candidate or the group working on the same theme, and, where applicable, the corresponding achievements.

This file is made available to the members of the jury 15 days before the start of the event.

3 – EVALUATION MODES: Point form

- **Occasional test:** oral lasting 1 hour.
- **Factor** 5

A. Candidates from the school route, apprenticeship

The evaluation comprises two phases :

– Phase 1: evaluation by the educational team of the preparation of the project.

The pedagogical team supervising the candidate during his preparation, evaluates him through competence C3.1. This evaluation can be based, for example, on project reviews or the monitoring of a project schedule.
The result of this evaluation is not communicated to the candidate and is decided upon by the final jury.

– Phase 2: evaluation of the presentation of the project by an evaluation committee.
It is divided into two parts during which the commission evaluates all or part of skills C1.2, C3.2 and C5.2 and C6.1.

- **First part: Presentation of the candidate before the commission of interrogation: duration maximum 40 min.**

  This phase must allow the candidate to present the file of the work he has carried out. It uses modern presentation techniques. Based on his project file, he explains the entire process followed to ensure compliance with the specifications.

  It describes the context of the project, insists particularly on the constraints induced by this context.
  It presents and justifies the steps taken, the technical solutions and the procedures adopted. It particularly comments on the validation procedures (calculations, simulations, possible tests,

…), emphasizing the hypotheses, the choice of treatment models and the interpretation of the results within the framework of the project. It indicates and justifies any amendments to the functional specifications, it provides useful elements for a detailed economic assessment.

During this part, the candidate is not interrupted by the interrogation commission.

- **Second part: Interview with the interrogation commission: maximum duration 20 min**

At the end of the previous phase of the test, the committee, which has carried out an in-depth examination of the file, engages in a dialogue with the candidate to:

- ensure the candidate's autonomy of thought and action within the team with which he has worked;
- assess the candidate's ability to respond with relevant arguments to questions

questions asked in relation to the dossier and its presentation;
- deepen certain aspects of the project insufficiently valued in the written file and the oral presentation.

The commission of interrogation is composed of three members:
- an SII professor involved in STS Techniques and Services in Agricultural Equipment,
- a STMG professor involved in STS Techniques and Services in Agricultural Equipment,
- a professional.

In the event of absence of the representative of the profession, the commission can validly carry out its task of evaluation.

A professor who has supervised the establishment's projects will be present and available to the questioning committee. He does not participate in the interrogation commission.

The members of the interrogation committee take care to remain strictly within the framework defined by the expectations of the student's individual contract and validated by the approval committee, without calling into question the terms of this contract. Under no circumstances will the questioning go beyond the framework of the project and the skills to be assessed and will not relate to the associated knowledge.

The members of the questioning committee and the teaching team use the national evaluation grids.

B. Non-academic applicants

The test, which retains the same objectives, is supported by an industrial project file which is submitted by the academic authority one month before the start of the test. The candidate explains and justifies the elements of the file provided to him, in the same spirit as that described in phase 2 for candidates from school. It allows the committee to assess all or part of skills C1.2, C3.1, C3.2, C5.2 and C6.1.

For these candidates, the test takes place in a public establishment with a senior agricultural equipment technician section.

4 - EVALUATION

The evaluation sheet for the work carried out, drawn up and updated by the General Inspectorate of National Education, will be distributed to the establishments by the rectorial services for examinations and competitive examinations.

EF1 test: LIVING LANGUAGE (EXCLUDING ENGLISH)

1. Principles

In order not to limit the expression to the language imposed by the diploma (English), the candidate will be offered, within the framework of an optional oral test: - a support relating to his specialty whose comprehension will be checked, - another type of support for the actual foreign language interview.

2. The oral test

Duration: 20 minutes, preparation: 20 minutes
It will take place as follows :

A. Written work in the dressing room of 20 minutes during which the candidate will produce a summary, a commentary, of 15 to 20 lines from a general support dealing with the field of industrial sciences and techniques (textual, iconographic support or brief audio recording or video).

B. Interview in a foreign language with the examiner based on the support and the written work carried out by the student in order to verify understanding of the document; it is not excluded that the examiner proposes to the candidates specific exercises intended to check this understanding: translation of a few lines, creation of the legend of a diagram from a text, answer to questions in a foreign language. .. this in order to avoid an abusive recourse to French.

During the preparation, the candidate will have at his disposal the various supports.

Definition of the optional test of French sign language (LSF) in the specialties of higher technician patent

oral test lasting 20 minutes, preceded by a preparation time of 20 minutes.

(including the time needed to become familiar with the documents offered to the candidate).

The test is based on a document provided by the examiner. Throughout the test, the examiner and the candidate communicate only in sign language to the exclusion of any other language.

Course of the test :

During the 20-minute preparation time, the examiner offers the candidate two documents

- a contemporary iconographic document, - a
contemporary text, written in French with a maximum length of 2000 typographical signs.

During the same day of questioning, each examiner will make sure to offer two different documents to each candidate.

The candidate chooses which of the two documents will be assessed on (the time spent discovering the documents is an integral part of the 20 minutes of preparation).

The candidate presents the document he has chosen without being interrupted or restarted by the examiner. This presentation, which should not be a formal commentary, is followed by an interview conducted by the examiner who, based on the support document and the candidate's presentation, formulates questions to, for example, enable the candidate to specify an analysis or a point of view or develop an idea.

Assessment criteria :

Candidates are expected to express themselves clearly in a sufficiently wide range of languages to be able to describe, express a point of view, and even develop an argument.

The candidate must:

a) for the presentation of the document (duration: 5 minutes, scored out of 10 points)

- be able to report on the content of the document offered to him, be able to describe it, explain the situation or the theme presented, make a personal comment if he deems it appropriate or relevant.

- demonstrate their ability to sign clearly, at a natural pace and at a level that does not hinder not the transmission of his presentation.

b) for the interview (duration: 15 minutes, scored out of 10 points)

- understanding familiar and frequent signs relating to familiar areas or questions of topicality that the examiner uses in a natural way. be
- able to cope with a communication situation where he is asked to receive a message or a question correctly, in order to be able to react or respond by expressing himself in turn with clear signs and at a suitable pace.

- Demonstrate a certain ease: sign continuously to express or defend a point of view, argue, or even bring a contradiction.

The candidate, like the reviewer, can extend the discussion to other points not directly related to the document.

Appendix III a: TRAINING SCHEDULE

	1st year schedule			**2nd year schedule**			***Associated knowledge*** *Where* ***mobilized***
	week (1)	**year (student schedule)**	**a + b + c (2)**	**week (1)**	**year (student schedule)**	**a + b + c (2)**	
General culture and expression	3	90	2+1+0	3	90	2+1+0	***S1***
English	3	90	1+2+0	3	90	1+2+0	***S2***
Math	2	60	1+1+0	2	60	1+1+0	***S3***
Chemical Physics	2	60	0 + 0 + 2 (c)	2	60	0+0+2(c)	***S4***
Personalized support (3)	2	60	0 + 0 + 2 (d)				
Economy-Management applied to agricultural equipment (4)	4	120	1+3+0	3	90	1+2+ 0	***S8***
Modeling of the behavior of materials	4	120	1+3+0	3	90	1+2+ 0	***S6***
Agronomy and knowledge of the agricultural equipment industry	3	90	3+0+0	3	90	3+0+0	***S5, S9 and S10***
Organization of maintenance and after-sales (5)	2	60	1+1+0	2	60	1+1+ 0	***S6, S8 and S9***
Technology and intervention on materials	8	240	2 + 0 + 6 (e)	8	240	1 + 0 + 7 (e)	***S5, S6, S7, S8, S9 and S10***
Project (6)				4	120	0 + 0 + 4 (f)	***All knowledge***
total	33	990	12 + 11 +11	33	990	10+10+13	

The first year of training includes 36 weeks, of which a minimum of 6 are devoted to an internship (7) in a company (or professional environment) at the end of the year. This internship gives rise to the establishment of an activity report (E61 test of unit U6).

The second year of training consists of 30 weeks. 120 hours a year are devoted to the project during the second part of the second year of training as part of the E62 test of the U6 professional unit

(1): weekly timetable given as an indication.

(2): example of distribution over a week. The weighting over the year must be respected.
Example: 1 +1 + 0 = 50% of the current annual timetable, 50% of the annual timetable in tutorials and 0% in practical work.

(3): 60 "year" hours are devoted in the first year to personalized support in order to standardize skills between STI2D baccalaureate holders and professional baccalaureate holders in the sector. The use of this timetable is to be preferred over the first half of the year.

(4): teaching provided by a STMG teacher

(5): teaching in whole division provided by an SII professor, teaching in tutorials provided in co-teaching by an SII professor and a STMG professor

(6): 120 "year" hours are devoted to the project, support for the E62 test of the U6 professional unit. Depending on the nature of the projects, supervision is provided by SII professors and a STMG professor.

(7): the work placement is monitored by SII and STMG professors.

a = lesson: integer division

b = tutorials: duplication from the 24th student

c = practical work: duplication from the 16th in **Physics - Chemistry**

d = practical work: duplication from the 16th in **Personalized Support** (1st year)

e = practical work: duplication from the 12th in **Technology and intervention on materials**

f = practical work: duplication from the 12th in **Project**

Annex III b: INTERNSHIP IN A PROFESSIONAL ENVIRONMENT

1- Objectives

A compulsory internship period in a professional environment is organized for the candidate for the higher technician certificate in Techniques and Services in Agricultural Equipment. This internship is a time of information and training aimed at: - discovering in depth the world of business, by participating fully in its activities, by observing to understand them the modes of organization and the human relations that drive it , as well as the strengths and constraints; - deepen and put into practice the technical and professional skills acquired or in the process of being acquired, by being associated with the technical tasks, with the projects in progress and by discovering the specificities of the company; - to inform, inform and report, in writing and orally, within the framework of the drafting of a structured internship report and its defense in front of a jury, with the aim of demonstrating its ability to analyze a situation of maintenance of agricultural equipment and to implement the skills acquired in communication.

If the internship in a professional environment is not, in the regulatory sense of the term, a period of training in a company validated by the verification of new skills acquired, it is the privileged place to discover, observe and understand situations related to maintenance and services associated with agricultural equipment that are only very rarely found in schools, such as:

- operations planning and management; the implementation
- of quality improvement plans, human resources management, training; compliance with risk prevention and safety improvement policies.
-

Whatever their level of relevance, the professional situations present in the company then make it possible to concretely illustrate the activities of the reference system and in particular: reception and advice of the customer, organization of after-sales activities, as well as the concerns cross-cutting areas identified: safety, animation, coordination, quality and information.

2- Place of the internship

The place of the internship is chosen in order to be able to achieve its objectives. It takes place: - at a dealership - at a manufacturer - within a CUMA or an EDT (formerly ETARF) with an integrated maintenance department.

- if necessary, within an independent body (control or certification body) or a local authority having recourse to the skills of a senior technician in Techniques and Services in Agricultural Equipment.

3- Duration of the internship

The internship takes place at the end of the first year of training. Its duration is six to eight weeks. It may be reduced in the event of force majeure duly noted and with the rector's agreement, but may not be less than four weeks.

4- Organization

4.1 School path

4.1.1 Regulations relating to internships in a professional environment The internship, organized with the assistance of professional circles, is placed under the control of the academic authorities to which the student reports and, if necessary, the services of the cultural adviser at the French Embassy. of the host country for an internship abroad.

Each period of internship in a company is subject to an agreement between the establishment attended by the student and the host company(ies). The agreement is established in accordance with the provisions of Decree No. 2006-1093 of August 29, 2006 taken for the application of Article 9 of Law No. 2006-396 of March 31, 2006 for equal opportunities.

During the internship, the student must have the status of student intern and not employee.
However, this agreement may be adapted to take into account the constraints imposed by the legislation of the host country.

The internship agreement must in particular:

- set the terms and conditions of coverage for accidents at work and civil liability; - specify the objectives and methods of training (duration, timetable); - specify the methods of follow-up of the trainee by the teachers of the responsible teaching team of training and the student.

4.1.2. Implementation and follow-up of the internship The search for host companies is carried out by the students, under the responsibility of the head of the establishment. The internship must be carefully prepared by the team of teachers of the professional disciplines in close liaison with **all the courses, the entire teaching team being concerned by the internship period.** It is important for students to feel the interest that their professors have in the company and to be able to discuss with them their impressions and discoveries, the elements of analysis to be favored and the main points of their internship report.

Internship time in a professional environment is organised, taking into account:

- material constraints of businesses and schools; - skills acquired or in the process of being acquired by trainees; - the professional functions of the repository; - skills to be validated during the evaluation.

At the end of the internship, two documents are given to the intern by the company manager or his representative: - a certificate attesting to the student's presence;

- the table of tasks that can be performed during the work placement (see appendix IIIc).

A candidate who has not presented these documents cannot be admitted to take the certification sub-test **E61** (Activities in the professional environment).
A candidate who, for a duly established reason of force majeure, completes only part of the compulsory internship, may be authorized by the rector to take the examination, subject to having completed the minimum duration of four weeks, the jury being kept informed of his situation.

4.1.3. Internship report
At the end of the internship, school candidates write a report presenting the elements defined by the certification reference system. These developments must be structured and must make it possible to explain the assigned objectives, the results obtained or observed, the constraints taken into account and be accompanied by personal comments. A short conclusion of the internship, highlighting the discoveries made by the candidate and what he will retain in connection with his professional project.

The set must be limited to 40 pages favoring personal developments and limiting as much as possible the reproductions of documents available in the company.

The defense of this report before a jury consists of an oral presentation by the candidate. In addition to the report, the latter can make use of specific presentation documents allowing him to synthesize and illustrate his remarks by using the appropriate means of communication.

4.1.4. Documents for the evaluation
The commission of interrogation uses the work evaluation sheet, drawn up and updated by the General Inspectorate of National Education (distributed to the rectoral services of examinations and competitions).
This evaluation sheet is the only document to be communicated to the jury, in particular to the questioning commission for the **E61 certification sub-test.**

4.2 Path of learning

For apprentices, the internship certificates are replaced by a photocopy of the employment contract or by a certificate from the employer confirming the candidate's status as an apprentice in his company. The educational objectives as well as the supports of the **E61** certification sub-test (Activities in the professional environment) are the same as those of the candidates of the school route.

4.3 Continuing Education Path

Candidates who are preparing for the Advanced Technician Certificate in Agricultural Equipment Techniques and Services through continuing education write a report on their professional activities in the same spirit as the internship report.

4.3.1. Candidates in a situation of first training or in a situation of retraining The duration of the internship is 6 to 8 weeks. It is added to the duration of training provided in the continuing education center pursuant to Article 11 of Decree No. 95-665 of May 9, 1995 as amended on the general regulations for the higher technician patent.

The training organization can help find the host company. The trainee may have the status of employee of another professional sector.

When this preparation is carried out within the framework of a particular type of employment contract, the compulsory internship is included in the training period provided in a professional environment if the activities carried out are consistent with the requirements of the reference system for the higher technician certificate. Techniques and Services in Agricultural Equipment and in accordance with the objectives and general terms defined above.

4.3.2. Candidates in a situation of improvement The internship certificate may be replaced by one or more work certificates attesting that the person concerned has been employed in the field of Techniques and Services in Agricultural Equipment, as a full-time employee for six months during the of the year preceding the examination or part-time for one year during the two years preceding the examination. The activities carried out must be consistent with the requirements of the reference system.

Candidates write a report on their professional activities in the same spirit as the internship report.

4.4 Candidates in distance education

Candidates fall under one of the above cases, depending on their status (student, apprentice, continuing education).

4.5 Candidates presenting themselves on the basis of their professional experience

The internship certificate may be replaced by one or more work certificates attesting that the person concerned has been employed in the field of Agricultural Equipment Techniques and Services, as a full-time employee for six months during the year preceding examination or part-time for one year during the two years preceding the examination. The activities carried out must be consistent with the requirements of the reference system.

These candidates write a report on their professional activities in the same spirit as the internship report.

TABLE OF TASKS WHICH WERE PERFORMED DURING INTERNSHIP IN A PROFESSIONAL ENVIRONMENT

Activities		Main tasks Support
A1- Welcoming and advising the client or user. **Receipt, return or provision of equipment.**	**1T1**	the customer or user, perform a pre-diagnosis.
	1T2	Write the repair order, make an appointment and plan the intervention.
	1T3 Receive the material.	
	1T4	Carry out pre-diagnostic tests, draw up an estimate.
A2-Diagnosis	**2T1**	Collect, analyze, interpret the information necessary for the diagnosis Carry out the tests, the static or dynamic
	2T2	tests and formulate hypotheses on the **3T1** malfunction Organize the **3T2** intervention Organize the preparation of the **3T3** equipment
A3- Intervention – Preparation	Advise and assist the technicians	
	3T4	Validate the result of the intervention or the compliance of the preparation with the sales contract
	3T5 Set up or configure an on-board system **4T1** Manage workshop	
A4-Organization and management of after-sales activities	activity planning **4T2** Analyze a workshop management dashboard.	
	4T3 Manage workshop equipment	
A5-Human resources, facilitation, training	**5T2** Contribute to training	
A6-Adaptation of equipment	**6T3**	Ensure the follow-up of the realization and the provision to the customer
A7- Agrotechnical advice	**7T1**	Propose equipment relating to phytotechnical or zootechnical production
	7T2 Ensure the implementation of equipment	
A8 – Sale of complementary products, equipment or services	**8T1**	Participate in the development of additional sales support tools
	8T4	Propose by arguing the service or sales solution

APPENDIX IV: CORRESPONDENCE TABLE BETWEEN TESTS

This table has value only in terms of equivalence of tests between the old diploma of the BTS Agro-equipment and the new Technical and Services BTS in Agricultural Equipment during the transitional phase where some candidates can keep the benefit of exemption from certain tests. In no case does it mean a point-to-point correspondence between the proof contents.

BTS **Agricultural equipment** **Created by order of September 3, 1997**		**BTS** **Techniques and Services in Agricultural Equipment Created by this decree**	
Nature of the tests	***Unit***	***Nature of the tests***	***Unit***
E1 – French	**U1**	**E1 – General culture and expression**	**U1**
E2 – Foreign living language	**U2**	**E2 – English**	**U2** *
E3 – Mathematics – Physical Sciences		**E3 – Mathematics – Applied physical and chemical sciences**	
Subtest: Mathematics	**U31**	Subtest: Mathematics	**U31**
Subtest: Physical Sciences	**U32**	Subtest: Applied physical and chemical sciences	**U32**
E4 - Agro techniques		**E5 – Agro-technical case study**	
Subtest: Agricultural equipment advice	**U41**	Subtest: Agro technical analysis	**U51** **
Subtest: Design - Adaptation	**U42**		
Subtest: Diagnosis - Repair	**U43**	**E4 – Diagnosis or implementation**	**U4**
E5 – Applied Economics and Management		**E5 – Agro-technical case studies**	
Subtest : **Economic advice and sales**	**U51**	Subtest: Legal, economic and managerial analysis	**U52** ***
Subtest : **Management**	**U52**		
E6 – Professional summary test		**E6 – Professional summary test**	
Subtest: Project realization	**U61**	Subtest: Project	**U62**
Subtest: Company internship	**U62**	Subtest: Activities in the workplace	**U62**

* Repeating candidates who have not chosen English will be able to keep the language they have chosen for five years.

** A candidate benefiting from one of the U41 or U42 units of the old diploma can keep his grade and transfer it to the U51 unit of the new diploma. Candidates benefiting from both units will be able to report the most favorable mark on unit U51.

*** A candidate benefiting from one of the U51 or U52 units of the old diploma can keep his mark and transfer it to the U52 unit of the new diploma. Candidates benefiting from both units will be able to report the most favorable mark on unit U52.