DIDACTIC REGULATIONS OF THE DEGREE PROGRAM
PRECISION LIVESTOCK FARMING

CLASS LM-86

School: Agriculture and Veterinary Medicine

Department: Veterinary Medicine and Animal Production

Regulations in force since the academic year 2025-2026

ACRONYMS

CCD	[Commissione di Coordinamento Didattico]	Didactic Coordination Commission
CdS	[Corso/i di Studio]	Degree Program
CPDS	[Commissione Paritetica Docenti-Studenti]	Joint Teachers-Students Committee
OFA	[Obblighi Formativi Aggiuntivi]	Additional Training Obligations
SUA-CdS	[Scheda Unica Annuale del Corso di Studio]	Annual single form of the Degree Program
RDA	[Regolamento Didattico di Ateneo]	University Didactic Regulations

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Art. 1
Object

1. These Didactic Regulations govern the organisational aspects of the CdS in **Precision Livestock Farming** (class **LM-86**). The CdS in Precision Livestock Farming is hinged in the **Department of Veterinary Medicine and Animal Production**. The Course is held in **English**.
2. The CdS is governed by the **Didactic Coordination Commission** (CCD), pursuant to Art. 4 of the RDA.
3. The Didactic Regulations are issued in compliance with the relevant legislation in force, the Statute of the University of Naples Federico II, and the RDA.

Art. 2
Training objectives

The training objectives of the Master Degree in Precision Livestock Farming are to obtain professionals with knowledge and skills in new and emerging engineering solutions. These are useful for improving production efficiency and the health and welfare of livestock, minimizing impacts negative effects of animal production on the landscape, and protecting biodiversity and ecosystem services, in order to create an integration between breeding and the environment to support excellent territorial production.

During the first year of the course, the disciplines relating to the logistical and structural organization of farms, GIS and digital mapping techniques for the management and processing of territorial data will be explored in depth. The approach to the knowledge of robotics, sensors and artificial intelligence will provide the basis for the principles of precision techniques, which in the first year will concern forage production systems through the use of precision systems for irrigation and crop protection, also aimed at to the protection of the environment. The environmental impact of livestock farming is also the subject of study of the course with an approach both to the basic processes of energy production from biomass aimed at reducing greenhouse gases and to engineering plant and current legislation. The curricular teachings of the first year of the course also include the economic analysis of farm management and production process controls. Finally, during the first year, elements of advanced statistics for the management of so-called *big data* and basic knowledge on the use of artificial intelligence techniques will be provided. The second year of the course is dedicated to deepening knowledge of precision techniques applied to the direct management of animals belonging to different species from a productive, reproductive and nutritional point of view, as well as to the precision monitoring of infectious, parasitic and non-infectious diseases. The CdS training offer is expanded by 8 CFU to be obtained in subjects chosen by the student, by a 6 CFU training internship carried out in internal structures of the University or at the Improsta agricultural farm and a 6 CFU Stage carried out at private companies and public bodies, professional firms and producer associations affiliated with the University. In order to guarantee the provision of courses on topics that are always current and of interest, the CCD encourages teachers to update the contents of the elective courses or to propose new ones in the event that they were not chosen for three consecutive years. At the end of the second year, the student will have to produce a final degree thesis divided into two parts: an in-depth study of one of the topics covered during the training course, under the guidance of one of the professors of the Course of Studies and a report of the activities carried out during the training internship and the internship. The entire course is carried out in a residential form at the experimental Regional farm Improsta where, in addition to an arable land area of approximately 100 ha, there is a herd of 150 adult dairy buffaloes, an experimental dairy and several laboratories.

Art. 3
Professional profile and work opportunities

Production manager in Precision Livestock Farming.

Function in a work context:

- ✓ Organisational, managerial and/or technical support activity for the automation of information of high-tech agro-livestock and agri-food companies;
- ✓ Organizational and managerial activity and/or technical support for companies operating in the feed sector;
- ✓ Organizational and managerial activity and/or technical support in the industries producing equipment and software used in the breeding of species in livestock production;
- ✓ Organizational and managerial activity in public administrations operating in the livestock and agri-food sectors;
- ✓ Activities of evaluation, implementation and management of production processes through the use of software and IT platforms and of the strategies of companies involved in the primary production production chain;
- ✓ Evaluation activities of computerized management systems and data analysis of the entire production process for the evaluation of critical issues and sustainability of production.

Skills associated with the function:

The teachings included in the training course are aimed at acquiring the following skills in:

- ✓ Innovative precision agriculture and animal husbandry technologies for the entire production process;
- ✓ Innovative technologies for the transformation and final information of animal production through the use of computerized platforms;
- ✓ Emerging technologies in engineering sciences;
- ✓ Elements of chemical plants and theory of the development of chemical processes useful for dictating guidelines to livestock companies for the management and disposal of livestock waste;
- ✓ Planning, management and control of the automation of company information, which derives from robotics and sensor technologies applied to animal management.

Employment opportunities:

Graduates of the Master Degree class in Precision Livestock Farming in accordance with the qualifying training objectives of the class can operate:

- in the management of agro-livestock companies of different nature and in those with high technology;
- in technical consultancy activities for highly automated systems in agro-livestock and agri-food companies;
- in the management and/or technical consultancy for the production and use of food in agro-zootechnical and feed companies;
- in consultancy and organization of business financing plans;
- in the management of feed companies;
- in national and regional services for the protection of the environment and territory, international (FAO), national and regional environmental agencies;
- in regional, provincial and municipal departments, mountain communities, etc.;
- in public and private research institutions and universities.

Art. 4

Admission requirements and knowledge required for access to the Degree Program[1]

To be enrolled in the Master Degree in Precision Livestock Farming, a Bachelor's Degree or a three-year university diploma, or another qualification obtained abroad is required. Furthermore, curricular requirements, basic knowledge and a test to determine the adequacy of the personal preparation is mandatory. Furthermore, the verification of the English level is required.

Curricular requirements:

Students who have obtained a degree in one of the following classes can be enrolled:

- ex D.M. n. 270/2004:
  - ✓ Class L-25 - Agricultural and Forestry Sciences and Technologies;
  - ✓ Class L-38 - Zootechnical Sciences and Animal Production Technologies;
  - ✓ Class LM-42 - Veterinary Medicine.

- ex D.M. n. 509/1999:
  - ✓ Class 20 - Agricultural, Agri-food and Forestry Sciences and Technologies;
  - ✓ Class 40 - Zootechnical Sciences and Technologies and Animal Production;
  - ✓ Class 47/S - Veterinary Medicine.

It is possible to enroll graduate students in other classes subject to verification of the curricular path and the recognition of at least **40 ECTS** in the following characterizing sectors, identified as a minimum requirement:

- ✓ VET/01 Anatomy of domestic animals
- ✓ VET/02: Animal physiology;
- ✓ AGR/01: Rural economy and valuation;
- ✓ AGR/02: Agronomy and cultivations;
- ✓ AGR/17: Animal genetics and genetic improvement;
- ✓ AGR/18: Animal nutrition and feeding;
- ✓ AGR/19: Livestock Husbandry;
- ✓ AGR/20: Farmyard Animal Husbandry.

Basic knowledge:

Knowledge in basic areas such as Mathematics, General, Organic and Inorganic Chemistry, Biochemistry and knowledge in the following characterizing disciplines are required:

- ✓ VET/01 Anatomy of domestic animals
- ✓ VET/02: Animal physiology;
- ✓ AGR/01: Rural economy and valuation;
- ✓ AGR/02: Agronomy and cultivations;
- ✓ AGR/17: Animal genetics and genetic improvement;
- ✓ AGR/18: Animal nutrition and feeding;
- ✓ AGR/19: Livestock Husbandry;
- ✓ AGR/20: Farmyard Animal Husbandry.

Verification of the adequacy of the personal preparation

The evaluation of previous careers is the responsibility of the Didactic Coordination Commission. The verification of the adequacy of personal preparation is considered fulfilled if the graduate has

[1] Artt. 7, 13, 14 of the University Didactic Regulations.

obtained a degree grade equal to or higher than 91/110. For candidates who have obtained a degree grade lower than 91/110, the verification of their personal preparation will take place through an oral interview aimed at evaluating their knowledge in the basic requirements described above.

For candidates who have not yet obtained the qualification at the closing date for enrolment, but who obtain it by the deadline established by the Academic Bodies, the verification of the adequacy of personal preparation is considered fulfilled if, from the analysis of the university career, a weighted average greater than or equal to 25/30 results. Graduates with a weighted average lower than 25/30 will have to take the verification of personal preparation, according to the procedure described above.

Test of English language knowledge (level B2):
To access the Master Degree Course in Precision Livestock Farming, knowledge of the English language at level B2 of the Common European Framework for Languages is required. Where such knowledge is not officially certified, it will be verified by means of a placement test.

Art. 5
Procedures for access to the Degree Program (CdS)

1. The CCD of the Degree Program normally regulates the admission criteria and any scheduling of enrolments, except in cases subject to different provisions of law[2].
2. The verification of personal preparation is always mandatory, and only students who meet the curricular requirements can access it.
3. The enrolment to the CdS in Precision Livestock farming is limited and it is scheduled annually at local level. The programmed number is motivated firstly by the characteristics of the course which is residential at the Improsta agricultural farm. Furthermore, as part of the curricular activities, theoretical-practical lessons and educational workshops are planned to be given to groups of students with a limited number of 5-10 per shift so that the activities are effective and carried out safely.
4. A limited number of students are admitted to the course, as defined annually by the Didactic Coordination Commission in agreement with the Academic Bodies. Furthermore, a quota of positions is reserved for non-EU students. The Didactic Coordination Commission will evaluate any requests for enrolment of graduates at foreign universities by verifying the adequacy of the student's career and the possession of the minimum requirements. A merit ranking is drawn up for both EU and non-EU students, which takes into account:
   - ✓ the average of the exams, the degree grade and an oral interview for EU candidates;
   - ✓ the curriculum and all qualifications presented by non-EU candidates.

   If the number of candidates for enrolment in the Precision Livestock Farming Degree Course is lower than the programmed number, all students will be admitted to the first year of the Degree Course. However, if the number of candidates for enrolment is higher than the programmed number, only students usefully placed in the merit ranking will be enrolled. Once the results are known, students usefully placed in the merit ranking may complete the enrolment procedure within the terms established by the call for admission to the first year. The day after the expiry of this deadline, any availability of unfilled places will be announced. These places will be assigned according to the progressive order of the ranking itself. In the event of failure to fill the places reserved for non-EU students, the unfilled places may be assigned to Italian students according to the progressive order of the ranking.

[2] National programmed access is regulated by L. 264/1999 and subsequent amendments and supplements.

5. Enrollment of non-EU students occurs via registration on the Universitaly platform (https://www.universitaly.it/), whose opening and closing times are defined annually. The enrollment of EU students occurs through participation in an admission call which is usually issued in June/July and closes in September. The admission notice is published on the University website (www.unina.it) and on the Department of Veterinary Medicine and Animal Production website (www.mvpa-unina.org). Furthermore, an extract of the notice in English is also advertised by the Didactic Coordination Commission of the CdS and for purely informative purposes. The latter is published both on the Department website and on the social channels of the CdS and the Department itself.
6. Both EU and non-EU students are required to have knowledge of the English language at level B2 of the Common European Framework for Languages. Where this knowledge is not officially certified, it will be verified by means of a placement test.

Art. 6
Teaching activities and university training credit (Teaching activities and CFU)

Each training activity, prescribed by the CdS detail sheet, is measured in CFU. Each CFU corresponds to 25 hours of overall training commitment[3] per student and includes the hours of teaching activities specified in the curriculum as well as the hours reserved for personal study or other individual training activities.

For the Degree Program covered by this Didactic Regulations, the hours of teaching specified in the curriculum for each CFU, established in relation to the type of training activity, are as follows [4]:

- Lecture or guided teaching exercises: 5-10 hours per CFU;
- Seminar: 5-10 hours per CFU;
- Assisted teaching exercises (in laboratory or in classroom): 5-10 hours per CFU;
- Laboratory activities or fieldwork: 8-12 hours per CFU.

For internship activities, each credit corresponds to 25 hours of overall training commitment for each student [5]. The CFU corresponding to each training activity acquired by the student are awarded by satisfying the assessment procedures (examination, pass mark) indicated in the Course sheet relating to the course/activity attached to these Didactic Regulations.

Art. 7
Description of teaching methods

The didactic activity is carried out in Conventional modality.

If necessary, the CCD decides which courses also include teaching activities offered online.

Some courses may also take place in seminar form and/or involve classroom exercises, language, and computer laboratories.

Detailed information on how each course is conducted can be found in the course sheets.

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[3] According to Art. 5, c. 1 of Italian Ministerial Decree No 270/2004, "25 hours of total commitment per student correspond to university training credits; a ministerial decree may justifiably determine variations above or below the aforementioned hours for individual classes, by a limit of 20 per cent".

[4] The number of hours considers the instructions in Art. 6, c. 5 of the RDA: "of the total 25 hours, for each CFU, are reserved: a) 5 to 10 hours for lectures or guided teaching exercises; b) 5 to 10 hours for seminars; c) 8 to 12 hours for laboratory activities or fieldwork, except in the case of training activities with a high experimental or practical content, and subject to different legal provisions or different determinations by DD.MM.".

[5] For Internship activities (Inter-ministerial Decree 142/1998), subject to further specific provisions, the number of working hours equal to 1 CFU may not be less than 25. [please indicate below in the note any different regulatory provisions, e.g., "LM-13: 1 CFU = 30 hours, Note MUR, Director Cuomo, Prot. 570/2011; LM-51, L-24: 1 CFU = 20 hours professional training activity + 5 hours of further supervised training activity, D.M. 654/2022 (Art. 2, practical-assessment Internship)"]

Art. 8
Testing of training activities[6]

1. The CCD, within the prescribed regulatory limits[7], establishes the number of examinations and other means of assessment that determine the acquisition of credits. Examinations are individual and may consist of written, oral, practical, graphical tests, term papers, interviews, or a combination of these modes and are carried out in accordance with the "*Regulations for the management of exams*" of the Degree Course, approved by the Teaching Coordination Commission.
2. The examination procedures published in the course sheets and the examination schedule will be made known to students before the start of classes on the Department's website.[8]
3. Examinations are held subject to booking, which is made electronically. In case the student is unable to book an exam for reasons that the President of the Board considers justifiable, the student may still be admitted to the examination, following those students already booked.
4. Before examination, the President of the Board of Examiners verifies the identity of the student, who must present a valid photo ID.
5. Examinations are marked out of 30. Examinations involving an assessment out of 30 shall be passed with a minimum mark of 18; a mark of 30 may be accompanied by honours by a unanimous vote of the Board. Examinations are marked out of 30 or with a simple pass mark. Assessments following tests other than examinations are marked out with a simple pass mark.
6. Oral exams are open to the public. If written tests are scheduled, the candidate has the right to see his/her paper(s) after correction.
7. The University Didactic Regulations govern Examination Boards [9].

Art. 9
Degree Program structure and Study Plan

1. The legal duration of the Degree Program is 2 years. Enrolment is also possible on the basis of a contract according to the rules established by the University (Art. 21 University Didactic

[6] Article 22 of the University Didactic Regulations.

[7] Pursuant to the DD.MM. 16.3.2007 in each Degree Programs the examinations or profit tests envisaged may not be more than 20 (Bachelor's Degrees; Art. 4. c. 2), 12 (Master's Degrees; Art. 4, c. 2), 30 (five-year single-cycle Degrees) or 36 (six-year single-cycle Degrees; Art. 4, c. 3). Pursuant to the RDA, Art. 13, c. 4, "the assessments that constitute an eligibility evaluation for activities referred to in Art. 10, c. 5, letters c), d), and e) of Ministerial Decree no. 270/2004, including the final examination for obtaining the degree, are excluded from the calculation." For Master's Degree Program and single-cycle Master's Degree Program, however, pursuant to the RDA, Art. 14, c. 7, "the assessments that constitute a progress evaluation for activities referred to in Art.10, c. 5, letters d) and e) of Ministerial Decree no. 270/2004 are excluded from the exam count; the final examination for obtaining the Master's Degree and single-cycle Master's Degree is included in the maximum number of exams".

[8] Reference is made to Art. 22, c. 8, of the University Teaching Regulations, which states that "the Department or School ensures that the dates for progress assessments are published on the portal with reasonable advance notice, which normally cannot be less than 60 days before the start of each academic period, and that an adequate period of time is provided for exam registration, which is generally mandatory."

[9] Reference is made to Art. 22, paragraph 4 of the RDA according to which "Examination Boards and other assessments committees are appointed by the Director of the Department or by the President of the School when provided for in the School's Regulations. This function may be delegated to the CCD Coordinator. The Commissions comprise of the President and, if necessary, other professors or experts in the subject. In the case of active courses, the President is the course instructor, and in such cases, the Board can validly make decisions even in the presence of the President alone. In other cases, the President is a professor identified at the time of the Board's appointment. In the comprehensive evaluation of the overall performance at the conclusion of an integrated course, the professors in charge of the coordinated modules participate, and the President is appointed when the Commission is appointed."

Regulations). The student must acquire 120 CFU[10], attributable to the following Types of Training Activities (TAF):
A) basic,
B) characterising,
C) related or complementary,
D) at the student's choice[11],
E) for the final exam,
F) further training activities.

2. The degree is awarded after having acquired 108 CFU by passing examinations, not exceeding 12 exams, including the final exam, and the performance of other training activities.
   Unless otherwise provided for in the legal framework of University studies, examinations taken as part of basic, characterising, and related or supplementary activities, as well as activities chosen autonomously by the student (TAF D) are taken into consideration for counting purposes. Examinations or assessments relating to activities independently chosen by the student may be taken into account in the overall calculation corresponding to one unit[12]. Tests constituting an assessment of suitability for the activities referred to in Article 10, paragraph 5, letters d) and e) of Ministerial Decree 270/2004[13] are excluded from the count. Integrated Courses comprising of two or more modules are subject to a single examination.
3. In order to acquire the CFU relating to independent choice activities, the student is free to choose among all the Courses offered by the University, provided that they are consistent with the training project. This consistency is assessed by the Didactic Coordination Commission. Also, for the acquisition of the CFU relating to autonomous choice activities, the "passing the exam or other form of profit verification" is required (Art. 5, c. 4 of Ministerial Decree 270/2004).
4. The study plan summarises the structure of the Degree Program, listing the envisaged teachings broken down by course year and, in case, by curriculum. At the end, the propedeuticities envisaged by the Degree Program are listed. The study plan offered to students, with an indication of the scientific-disciplinary sectors and the area to which they belong, of the credits, of the type of educational activity, is set out in Annex 1 to these Didactic Regulations.
5. Pursuant to Art. 11, paragraph 4-bis, of Ministerial Decree 270/2004, it is possible to obtain the Degree according to an individual study plan that also includes educational activities different from those specified in the Didactic Regulations, as long as they are consistent with the CdS detail sheet of the academic year of enrollment. The individual study plan is approved by the Didactic

[10] The total number of CFU for the acquisition of the relevant degree must be understood as follows: six-year single-cycle Degree, 360 CFU; five-year single-cycle Degree, 300 CFU; Bachelor's Degree, 180 CFU; Master's Degree, 120 CFU.
[11] Corresponding to at least 12 ECTs for Bachelor's Degrees and at least 8 CFU for Master's Degrees (Art. 4, c. 3 of Ministerial Decree 16.3.2007).

[12] Pursuant to the D.M. 386/2007.
[13] Art. 10, c. 5 of Ministerial Decree. 270/2004: "In addition to the qualifying training activities, as provided for in paragraphs 1, 2 and 3, Degree Programs shall provide for: a) training activities autonomously chosen by the student as long as they are consistent with the training project [TAF D]; b) training activities in one or more disciplinary fields related or complementary to the basic and characterising ones, also with regard to context cultures and interdisciplinary training [TAF C]; c) training activities related to the preparation of the final exam for the achievement of the degree and, with reference to the degree, to the verification of the knowledge of at least one foreign language in addition to Italian [TAF E]; d) training activities, not envisaged in the previous points, aimed at acquiring additional language knowledge, as well as computer and telematic skills, relational skills, or in any case useful for integration in the world of work, as well as training activities aimed at facilitating professional choices, through direct knowledge of the job sector to which the qualification may give access, including, in particular, training and guidance programs referred to in Decree no. 142 of 25 March 1998 of the Ministry of Labour [TAF F]; e) in the hypothesis referred to in Article 3, paragraph 5, training activities relating to internships and apprenticeships with companies, public administrations, public or private entities including those of the third sector, professional orders and colleges, on the basis of appropriate agreements".

Coordination Commission and the Board of the Department of Veterinary Medicine and Animal production.

Art. 10
Attendance requirements[14]

1. In general, attendance at lectures is strongly recommended but not compulsory. In the case of individual courses with compulsory attendance, this option is indicated in the relative teaching/activity course sheet available in Annex 2.
2. If the lecturer envisages a different syllabus modulation for attending and non-attending students, this is indicated in the individual Course details published on the CdS web page and on the teacher's UniNA website.
3. Attendance at seminar activities that award training credits is compulsory. The relative modalities for the attribution of CFU are the responsibility of the CCD.

Art. 11
Prerequisites and prior knowledge

1. The list of incoming and outgoing propedeuticities (necessary to sit a particular examination) can be found at the end of Annex 1 and in the teaching/activity course sheet (Annex 2).
2. Any prior knowledge deemed necessary is indicated in the individual Teaching Schedule published on the course webpage and on the teacher's UniNA website.

Art. 12
Degree Program Calendar

The Degree Program calendar can be found on the Department's website well before the start of the activities (Art. 21, c. 5 of the RDA).

Art. 13
Criteria for the recognition of credits earned in other Degree Programs in the same Class[15]

For students coming from Degree Programs of the same class, the Didactic Coordination Commission ensures the full recognition of CFU, when associated with activities that are culturally compatible with the training Degree Program, acquired by the student at the originating Degree Program, according to the criteria outlined in Article 14 below. Failure to recognise credits must be adequately justified. It is without prejudice to the fact that the number of credits relating to the same scientific-disciplinary sector directly recognised by the student may not be less than 50% of those previously achieved.

[14] Art. 22, c. 10 of the University Didactic Regulations.
[15] Art. 19 of the University Didactic Regulations.

Article 14

Criteria for the recognition of credits acquired in Degree Programs of different classes, in university or university-level Degree Programs, through single courses, at online Universities and in international Degree Programs[16]; criteria for the recognition of credits acquired in extra-curricular activities

1. With regard to the criteria for the recognition of CFU acquired in Degree Programs of different Classes, in university or university-level Degree Programs, through single courses, at online Universities and in International Degree Programs, the credits acquired are recognised by the CCD on the basis of the following criteria:
   - analysis of the activities carried out;
   - evaluation of the congruity of the disciplinary scientific sectors and of the contents of the training activities in which the student has earned credits with the specific training objectives of the Degree Program and of the individual training activities to be recognised.

   Recognition is carried out up to the number of credits envisaged by the didactic system of the Degree Program. Failure to recognise credits must be adequately justified. Pursuant to Art. 5, c. 5-bis, of Ministerial Decree 270/2004, it is also possible to acquire CFU at other Italian universities on the basis of agreements established between the concerned institutions, in accordance with the regulations current at the time [17].
2. Any recognition of CFU relating to examinations passed as single courses may take place within the limit of 36 CFU, upon request of the interested party and following the approval of the CCD. Recognition may not contribute to the reduction of the legal duration of the Degree Program, as determined by Art. 8, c. 2 of Ministerial Decree 270/2004, except for students who enrol while already in possession of a degree of the same level[18].
3. With regard to the criteria for the recognition of CFU acquired in extra-curricular activities, within the limit of 12 CFU the following activities may be recognised:
   - Professional knowledge, skills, and certified skills, taking into account the congruence of the activity carried out and/or of the certified skill with the aims and objectives of the Degree Program as well as the hourly commitment of the duration of the activity.
   - Knowledge and skills acquired in post-secondary-level training activities, which the University contributed to developing and implementing.

Art. 15

Criteria for enrolment in individual teaching courses

Enrolment in individual teaching courses, provided for by the University Didactic Regulations[19], is governed by the "University Regulations for enrolment in individual teaching courses activated as part of the Degree Program"[20].

Article 16

Features and modalities for the final examination

1. The final exam of the Degree Course in Precision Livestock Farming is regulated by the "*Degree Exam Regulations*", approved by the Didactic Coordination Commission.

[16] Art. 19 of the University Didactic Regulations.

[17] Art. 6, c. 9 of the University Didactic Regulations.

[18] Art. 19, c. 4 of the University Didactic Regulations.

[19] Art. 19, c. 4 of the University Didactic Regulations.

[20] R.D. No. 348/2021.

2. The Master's Degree in Precision Livestock Farming is obtained after passing a final exam, consisting of the discussion of a paper written by the student under the supervision of a supervisor. The paper represents the completion of the Master's Degree course of study and consists of a document entirely written in English.
3. The thesis is divided into a first part, concerning a theme inherent to one or more disciplines of the study path, with the intent of making the most of the experience gained during the two years of the course, and a second part which contains a report of the internship and stage activities carried out during the training path. In addition to the thesis, the presentation and illustration skills of the topics covered and the critical discussion of the same will be evaluated.
4. The first part of the final exam paper can be generally traced back to the following typologies:
    - Experimental work carried out either in the Department's laboratories or in other research centers affiliated with the University. The thesis can also be carried out in non-affiliated structures outside the Department (farms or research centres) subject to the stipulation of an agreement with the University, for which the supervisor will be the contact person in order to guarantee the student's insurance coverage.
    - Analysis and processing of a large collection of sources and bibliography relating to a topic belonging to one of the SSDs present in the teaching system of the Course (Compilation thesis). The work in this case will consist of summarizing the content of the texts, creating a clear and orderly summary of the readings to be presented to the Graduation Commission.
5. The student can ask to carry out the degree thesis in basic, characterizing, similar/integrative courses activated by the study course, even if he has not taken the relevant exam, or has taken it with a another teacher than the one chosen as tutor. The Master's degree thesis is prepared by the student under the guidance and supervision of a teacher (supervisor), chosen among the teachers of the CdS in PLF and/or a teacher or researcher belonging to the Department of Veterinary Medicine and Animal Production. It is possible to complete the thesis under the guidance of a supervisor external to the Department, upon request to the Teaching Coordination Commission.
6. The final test takes place in a public session in front of a judging commission, during which the candidate will present an oral dissertation in English of the work by the graduating student. The Commission has the right to use remote telematic platforms to conduct the session; in this case the President of the Commission must notify the teaching office of the Department which will organize the session.
7. At the end of the presentation, the Commission will evaluate the student's commitment, autonomy and innovativeness during the activity covered by the dissertation. The candidate must present his/her work in an allotted time, highlighting the aims of the work carried out, the methodologies applied and the results obtained. At the end of the discussion of the thesis by all the candidates, the Commission, in a private session, formulates a summary judgment for each of them expressed through a score that can vary from zero to ten points.
8. The detailed provisions for the procedures to be carried out for the final exam are reported in the Final Exam Regulations, published on the Department website.

Article 17
Guidelines for traineeship and internship

1. Students enrolled in the Degree Program may decide to carry out *internships* or *training* periods with organisations or companies that have an agreement with the University. Traineeship and internship are compulsory and contribute to the award of credits for the other training activities

chosen by the student and included in the study plan, as provided for by Art. 10, par. 5, letters d and e, of Ministerial Decree 270/2004[21].

2. The CCD regulates the modalities and characteristics of traineeship and internship with specific Regulations.
3. The University of Naples Federico II, through Orientation and Tutoring commission, ensures constant contact with the world of work to offer students and graduates of the University concrete opportunities for internships and work experience and to promote their professional integration.

Article 18
Disqualification of student status[22]

A student who has not taken any examinations for eight consecutive academic years incurs forfeiture unless his/her contract stipulates otherwise. In any case, forfeiture shall be notified to the student by certified e-mail or other suitable means attesting to its receipt.

Article 19
Teaching tasks, including supplementary teaching, guidance, and tutoring activities

1. Professors and researchers carry out the teaching load assigned to them in accordance with the provisions of the RDA and the Regulations on the teaching and student service duties of professors and researchers and on the procedures for self-certification and verification of actual performance[23].
2. Professors and researchers must guarantee at least two hours of reception every 15 days (or by appointment in any case granted no longer than 15 days) and, in any case, guarantee availability by e-mail.
3. The tutoring service has the task of orienting and assisting students throughout their studies and of removing the obstacles that prevent them from adequately benefiting from attending courses, also through initiatives tailored to the needs and aptitudes of individuals.
4. The University ensures guidance, tutoring and assistance services and activities to welcome and support students. These activities are organised by the Schools and/or Departments under the coordination of the University, as established by the RDA in Article 8.

Article 20
Evaluation of the quality of the activities performed

1. The Didactic Coordination Commission implements all the quality assessment forms of teaching activities envisaged by the regulations in force according to the indications provided by the University Quality Presidium.
2. In order to guarantee the quality of teaching to the students and to identify the needs of the students and all stakeholders, the University of Naples Federico II uses the Quality Assurance (QA)[24] System, developed in accordance with the document "Self-evaluation, Evaluation and Accreditation of the Italian University System" of ANVUR, using:

[21] Traineeships ex letter d can be both internal and external; traineeships ex letter e can only be external.
[22] Art. 24, c. 5 of the University Didactic Regulations.
[23] R.D No. 2482//2020.
[24] The Quality Assurance System, based on a process approach and adequately documented, is designed in such a way as to identify the needs of the students and all stakeholders, and then translate them into requirements that the training offer must meet.

- surveys on the degree of placement of graduates into the world of work and on post-graduate needs;
- data extracted from the administration of the questionnaire to assess student satisfaction for each course in the curriculum, with questions relating to the way the course is conducted, teaching materials, teaching aids, organisation, facilities.

The requirements deriving from the analysis of student satisfaction data, discussed, and analysed by the Didactic Coordination Commission and the Joint Teachers' and Students' Committee (CPDS), are included among the input data in the service design process and/or among the quality objectives.

3. The QA System developed by the University implements a process of continuous improvement of the objectives and of the appropriate tools to achieve them, ensuring that planning, monitoring, and self-assessment processes are activated in all the structures to allow the prompt detection of problems, their adequate investigation, and the design of possible solutions.

Article 21
Final Rules

The Department Council, on the proposal of the CCD, submits any proposals to amend and/or supplement these Rules for consideration by the Academic Senate.

Article 22
Publicity and Entry into Force

1. These Rules and Regulations shall enter into force on the day following their publication on the University's official notice board; they shall also be published on the University website. The same forms and methods of publicity shall be used for subsequent amendments and additions.
2. Annex 1 (CdS structure) and Annex 2 (Teaching/Activity course sheet) are integral parts of this Didactic Regulations.

ANNEX 1

DEGREE PROGRAM DIDACTIC REGULATIONS

PRECISION LIVESTOCK FARMING

CLASS LM-86

School: Agriculture and Veterinary Medicine

Department: Veterinary Medicine and Animal Production

Regulations in force since the academic year 2022-2023

STUDY PLAN

KEY

Type of Educational Activity (TAF):

A = Management and sustainability

B = Characterising

C = Related or Supplementary

D = At the student's choice

E = Final examination and language knowledge

F = Further training activities

I YEAR									
Title Course	**SSD**	**Module**	**CREDITS**	**Hours**	**Type Activities**	**Course Modalities**	**TAF**	**Disciplinary area**	**Mandatory / optional**
Animal housing and environmental impact	AGR/10	Housing planning and design	10	50	Frontal lessons, practical activities	In person	B	Livestock and animal production disciplines	Mandatory
	AGR/19	Waste management and impact		50	Frontal lessons, practical activities	In person			
Digital mapping and precision irrigation	AGR/14	Digital Mapping, Geospatial Statistics and Decision Support	10	50	Frontal lessons, practical activities	In person	C	Related or Supplementary	Mandatory
	AGR/08	Precision Irrigation Systems and Sensing Technologies		50	Frontal lessons, practical activities	In person			
Big data approach and analysis	SECS-S/01	Statistical process control	8	50	Frontal lessons, practical activities	In person	A	Management and sustainability disciplines	Mandatory
	ING-INF/05	Livestock farming through Artificial Intelligence		30	Frontal lessons, practical activities	In person	C	Related or Supplementary	Mandatory
Biomass valorization for energy & commodities production and greenhouse gas mitigation	ING-IND/26	Biomass thermal conversion processes	9	40	Frontal lessons, laboratory, practical activities	In person	C	Related or Supplementary	Mandatory
	ING-IND/25	Bioconversion processes		50	Frontal lessons, laboratory, practical activities	In person			
Information technology for precision livestock farming	ING-INF/04	Robotics		40	Frontal lessons, laboratory, practical activities	In person	C	Related or Supplementary	Mandatory
	ING-INF/07	Instrumentation and measurements for livestock farming		50	Frontal lessons, laboratory, practical activities	In person			
Innovation management in livestock farm	AGR/01	Innovation management in livestock farm	5	50	Frontal lessons, practical activities	In person	A	Management and sustainability disciplines	Mandatory

II YEAR									
Title Course	**SSD**	**Module**	**CREDITS**	**Hours**	**Type Activities**	**Course Modalities**	**TAF**	**Disciplinary area**	**Mandatory/ optional**
New technologies applied to animal farming	AGR/19	Innovative approaches in large animals management	16	60	Frontal lessons, practical activities	In person	B	Livestock and animal production disciplines	Mandatory
	AGR/19	Management of livestock through innovative software		40	Frontal lessons, practical activities	In person			
	AGR/20	Management of Poultry and other small farmed animals		60	Frontal lessons, practical activities	In person			
Livestock health monitoring	VET/05	Infective diseases	13	50	Frontal lessons, practical activities	In person	B	Livestock and animal production disciplines	Mandatory
	VET/08	Non infective diseases		50	Frontal lessons, practical activities	In person			
	VET/06	Precision Strategies in Parasitology		30	Frontal lessons, practical activities	In person			
Precision feed production and management	AGR/18	Precision Nutrition and Feeding	12	70	Frontal lessons, practical activities	In person	B	Livestock and animal production disciplines	Mandatory
	AGR/12	Precision crop protection		50	Frontal lessons, practical activities	In person	C	Related or Supplementary	
Elective Module I			4	40		In presence	D	At the student's choice	Mandatory
Elective Module II			4	40		In presence	D	At the student's choice	Mandatory
Training			6	150			F	Further training activities	Mandatory
Stage			6	150			F	Further training activities	Mandatory
Final Report			8	200			E	Final examination and language knowledge	Mandatory

List of propaedeuticities

NONE

ANNEX 2.1

DEGREE PROGRAM DIDACTIC REGULATIONS

PRECISION LIVESTOCK FARMING

CLASS LM-86

School: Agriculture and Veterinary Medicine

Department: Veterinary Medicine and Animal Production

Regulations in force since the academic year 2025-2026

Course: Animal housing and environmental impact - Housing planning and design - Waste management and impact	**Teaching Language:** English
SSD (Subject area): AGR/10 – RURAL BUILDINGS AND AGROFORESTRY LAND (Housing planning and design) …… AGR/19 – LIVESTOCK HUSBANDRY (Waste management and impact) ……	Credits: 5 5
Course year: I	**Type of Educational Activity:** LIVESTOCK AND ANIMAL PRODUCTION DISCIPLINES
Teaching Methods: in-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Deal with issues concerning agricultural, forestry and agro-industrial constructions and related technical systems, the territory and the rural landscape, including the design, recovery and valorisation of buildings and systems for agricultural and forestry production or serving the different modes of use of the rural territory, the survey, analysis and representation of the natural and anthropic components of the rural and forest territory. The analysis and planning of agricultural and forestry systems, rural and forestry constructions, constructions and systems for agriculture, for protected crops, for the initial processing, conservation and transformation of agricultural and forestry products, for aquaculture and for the treatment of agricultural, forestry and agro-industrial wastewater, for the protection of the environment, the infrastructures for the agricultural and forestry territory, the techniques for surveying and representing the rural and forestry territory. Deal with issues relating to agro-breeding technologies, in different environments and livestock systems, respecting hygiene and the environment, animal welfare and protecting product quality.	
Objectives: The training objectives of the Course aim at full understanding of breeding structures, in terms of sizing and microclimate to guarantee animal health and welfare in all species of livestock. The main issues regarding the environmental impact of livestock systems and modern management techniques for livestock effluents are also analysed.	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: **Oral exam**	

Course: New technologies applied to animal farming ✓ Innovative approaches in large animals management ✓ Management of livestock through innovative software ✓ Management of Poultry and other small farmed animals	**Teaching Language:** English

SSD (Subject area): AGR/19 – LIVESTOCK HUSBANDRY (Innovative approaches in large animals management) ..... AGR/19 – LIVESTOCK HUSBANDRY (Management of livestock through innovative software) ..... AGR/20 – FARMYARD ANIMAL HUSBANDRY (Management of Poultry and other small farmed animals)	Credits: 6 4 6

Course year: II	**Type of Educational Activity:** LIVESTOCK AND ANIMAL PRODUCTION DISCIPLINES

Teaching Methods:
in-person

Contents extracted from the SSD declaratory consistent with the training objectives of the course:
The contents are related to the morpho-functional, ethological and reproductive evaluation of the different species, including pets and hunting fauna, integrating the knowledge to develop breeding biotechnologies and agrotechnologies, in different environments and zootechnical systems, in compliance with hygiene, environmental, and animal welfare standards as well as protecting quality products. The training skills concern the morpho-functional evaluation of animals in zootechnical production, ethology, ecology and zootechnical physio-climatology, methodologies and biotechnologies applied to animal breeding, special zootechnics, evaluation of the quality of animal products, the annual procurement and the livestock products industry. The contents are also related to poultry, rabbit and aquatic species, characterized by a short life cycle and industrialization of the production, transformation and marketing of products processes, finalized to systems and breeding techniques able to produce high quality-quantitative products. The training skills concern zootechnical physio-climatology, aquaculture, breeding avifauna, lab and fur animals, poultry farming, rabbit farming and zooculture.

Objectives:
The educational objectives of the course aim to provide practical skills to: manage the farm according the information collected by sensors and other precision technologies; improve the ability to apply differential diagnosis; develop the use of spreadsheets and specific programs for farm management.

Propaedeuticities:
None
Is a propaedeuticity for:
None

Types of examinations and other tests:
Oral exam – Practical exam

Course: Biomass valorization for energy & commodities production and greenhouse gas mitigation - Biomass thermal conversion processes - Bioconversion processes	**Teaching Language:** English

SSD (Subject area): ING-IND/26 – THEORY OF THE DEVELOPMENT OF CHEMICAL PROCESSES (Biomass thermal conversion processes) ..... ING-IND/25 – CHEMICAL PLANTS (Bioconversion processes)	Credits: 4 5

Course year: I	**Type of Educational Activity:** RELATED OR SUPPLEMENTARY

Teaching Methods:
in-person

Contents extracted from the SSD declaratory consistent with the training objectives of the course:
The course contents concern the methods of biomass characterization and analysis and the main thermochemical conversion processes for the production of bio-energy, bio-fuels and bio-materials. In particular, the aspects relating to the main pre-treatments (drying, screening, separation, densification and torrefaction), the fundamentals and technologies of pyrolysis, gasification and combustion processes and the main slow and fast pyrolysis reactors are studied in depth. The issues of safety in plant management and environmental aspects are also addressed. The course also aims to provide knowledge of the main methods and tools used for the characterization of the pyrolysis dynamics of biomass and its components (TGA and DSC) and for the chemical characterization of pyrolysis gas and bio-oil (GC, GC -MS and HPLC)..

Objectives:
The course aims at providing students with fundamentals sufficient for enabling them to evaluate the chief chemico-physical properties of biomass to select the proper pre-treatments and the adequate conversion technologies depending on feedstock properties, and for further understanding of biomass thermo-chemical processes.

Propaedeuticities:
None
Is a propaedeuticity for:
None

Types of examinations and other tests:
Oral exam

Course: Digital mapping and precision irrigation - Digital mapping, geospatial statistics and decision support - Precision Irrigation Systems and Sensing Technologies	**Teaching Language:** English

SSD (Subject area): AGR/14 – PEDOLOGY (DIGITAL MAPPING, GEOSPATIAL STATISTICS AND DECISION SUPPORT) ..... AGR/08 – AGRICULTURAL PLUMBING AND PLUMBING-FORESTRY SYSTEMS (PRECISION IRRIGATION SYSTEMS AND SENSING TECHNOLOGIES)	Credits: 5 5

Course year: I	**Type of Educational Activity:** RELATED OR SUPPLEMENTARY

Teaching Methods:
in-person

Contents extracted from the SSD declaratory consistent with the training objectives of the course:
Addressing the problems inherent to the soil-plant system as a result of the actions and interactions of environmental and anthropic factors that condition its evolutionary dynamics, and outlines principles and methods of classification, evaluation and spatial and cartographic distribution of soils, as well as for the planning of irrigation. The training skills concern pedology, genesis, geography, classification and cartography of soils and soil reconstruction, techniques and methods of soil assessment. The issues related to soil hydrology and knowledge for the design of irrigation systems are also taken into consideration. Agricultural and forestry hydraulics, soil hydrology and defense, agrometeorology and estimation of irrigation needs, environmental protection and integrated management of small basins, water resources in agroforestry systems, water supply and disposal, water systems for the farm and agro-industrial industries , irrigation and drainage.

Objectives:
The training objectives of the course aim to provide knowledge on the main physicochemical and hydraulic characteristics of the soil, retrieve and analyze data from different collections of observations to produce high resolution data with low cost, auxiliary and environmental covariates, analyze and model the geospatial variability of the characteristics of crops / livestock and a digital mapping of the variables relating above all to meteorological, pedological, cultural and zootechnical conditions. Furthermore, knowledge is provided on the efficiency of the various irrigation systems, also acquiring meteorological data, in order to calculate the needs and aggregate the information available to support management decisions.

Propaedeuticities:
None
Is a propaedeuticity for:
None

Types of examinations and other tests:
Oral exam

Course: Innovation management in livestock farm	**Teaching Language:** English
SSD (Subject area): AGR/01 – AGRICULTURAL ECONOMICS AND LAND APPRAISAL	Credits: 5
Course year: I	**Type of Educational Activity:** MANAGEMENT AND SUSTAINABILITY DISCIPLINES
Teaching Methods: in-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The course deals with the problems related to the economic, political, managerial and estimative aspects of the production, transformation, distribution, market and consumption of primary sector products (agriculture, forestry and fishing) and agro-biotechnologies. The course also deals with their relations with the other components of the socio-economic and environmental system and the economic aspects of environmental impact assessment. The training skills of the sector include the economy and agricultural policy together with the mountain, forestry and agro-industrial policy regarding rural territory and its resources, companies and technical means used, including agrobiotechnologies, the economic aspects of planning and management of the territory and the rural environment, the interactions between agricultural systems and economic development, rural and environmental valuation.	
Objectives: The educational objectives of the course aim to provide knowledge on the ability to analyze and fully understand the processes and mechanisms of generation and management of innovation, to elaborate managerial decisions related to the evaluation of innovation, to support communication skills regarding analytical procedures and of interaction with business executives and interpreting the analysis and management of innovation.	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: **Oral exam**	

Course:	Teaching Language:
Livestock health monitoring ✓ Infective diseases ✓ Non infective diseases ✓ Precision Strategies in parasitology	English

SSD (Subject area):	Credits:
VET/05 – INFECTIOUS DISEASES OF DOMESTIC ANIMALS (Infective diseases)	5
VET/08 – INTERNAL VETERINARY MEDICINE (Non infective diseases)	5
VET/06 – PARASITOLOGY AND PARASITIC DISEASES OF ANIMALS (precision starategis in parasitology)	3

Course year:	Type of Educational Activity:
II	LIVESTOCK AND ANIMAL PRODUCTION DISCIPLINES

Teaching Methods:
in-person

Contents extracted from the SSD declaratory consistent with the training objectives of the course:
INFECTIOUS DISEASES OF DOMESTIC ANIMALS:
The contents of the sector concern infectious and diffusive pathologies of all domestic species (mammals, birds, fish) and wild, with consequences on public health and on the quantity and quality of livestock production. Starting from the basics of bacteriology, virology (including unconventional agents) and immunology, the aspects relating to the etiology, epidemiology, pathogenesis, diagnosis and prophylaxis of infectious diseases of animals are developed and explored, including the study of exotic diseases, hygiene and veterinary health organization and biotechnology for diagnostic purposes and for the preparation of immunizing aids, also in the context of epidemic emergencies. The training skills concern general and applied microbiology to animal production, veterinary microbiology, virology and immunology, veterinary epidemiology, infectious diseases, prophylaxis, police and veterinary public health, veterinary hygiene and biotechnology, pathology and technology of poultry, rabbits and game species.
INTERNAL VETERINARY MEDICINE
The sector groups together the topics that address the study of etiopathogenesis, epidemiology, symptomatology, diagnosis, differential diagnosis and therapy of animal diseases, direct clinical, laboratory and instrumental investigations, including diagnostic imaging. The sector also includes the deepening of knowledge relating to the laws and regulations of veterinary competence, the rules of animal welfare and protection, civil and criminal liability and the ethics of the veterinary doctor. The training skills concern clinical medicine and medical therapy, laboratory medical diagnostics and clinical immunology, legal medicine and veterinary legislation, animal protection and ethics, medical pathology and clinical epidemiology, radiology, diagnostic imaging and endoscopy, medical semiotics and veterinary clinical methodology
PARASITOLOGY AND PARASITIC DISEASES OF ANIMALS
The sector represents a cultural-scientific complex that studies fungi, protozoa and metazoa (parasites) that determine in animal organisms (hosts) pathological phenomena normally defined as "parasitic diseases", many of which are zoonoses; it develops basic knowledge on parasites, on their biology and on the parasite-host-environment relationship, addressing the systematic, evolutionary, genetic, ecological, immunological, physiological and pathological aspects, also through the use of statistical-mathematical, biochemical and molecular methodologies; it develops application aspects, such as epidemiology, diagnosis, prophylaxis, therapy and control of parasitic diseases of humans, domestic animals and wild animals, including the fight against disease vectors and the socio-economic factors linked to parasitoses. The training skills concern sanitary entomology and disinfestation techniques, parasitology, ecoparasitology and sanitary management of wild fauna, parasitic and fungal diseases of animals and their epidemiology, biotechnologies applied to parasitology.

Objectives:
INFECTIOUS DISEASES:
The educational objectives of the course aim to provide practical skills for a rational approach to the management of infectious diseases at the level of farming (breeding, production), as well as of the environment. A further objective is to provide the bases for the prevention, control and treatment of infectious diseases.
NON-INFECTIOUS DISEASE:
The students should demonstrate knowledge, understanding and contextualization of the problems related to individual and herd pathologies of ruminants. Furthermore, they should be able to elaborate and define the link between predisposing agents, causal agents and management of these pathologies starting from the knowledge acquired. The proposed teaching course aims to provide knowledge and methodological tools necessary to analyze, define, manage, and support the veterinarian to solve clinical problems.

PRECISION STRATEGIES IN PARASITOLOGY The educational objectives of the course aim to provide practical skills for a rational approach to the management of parasitic diseases at the level of farming (breeding, production), as well as of the environment. A further objective is to provide the bases for the prevention, control and treatment of parasitic diseases.
Propaedeuticities: None **Is a propaedeuticity for:** None
Types of examinations and other tests: **Oral exam**

Course: Precision feed production and management - Precision nutrition and feeding - Precision crop protection	**Teaching Language:** English

SSD (Subject area): AGR/18 – ANIMAL NUTRITION AND FEEDING (Precision nutrition and feeding) ..... AGR/12 – Vegetal Pathology (Precision crop protection)	Credits: 7 5

Course year: II	**Type of Educational Activity:** LIVESTOCK AND ANIMAL PRODUCTION DISCIPLINES

Teaching Methods:
in-person

Contents extracted from the SSD declaratory consistent with the training objectives of the course:
To deal with issues related to the animal feeding, the digestive and metabolic use of nutrients, the physical, chemical and nutritional characteristics of feed. It outlines principles of animal nutrition and develops biotechnologies and feed agro-technologies that could positively affect animal production, animal welfare and the characteristics of livestock products with reference to their compliance with the technological, nutritional and health for consumers and the relationships between animal nutrition and environmental pollution. The training skills concern zootechnical feeds, dietetics and feed hygiene on farms, correct formulation of diets and the use of precision sensors useful for improving production performance and the well-being of livestock animals. A set of research topics that address, from a morphological, physiological, epidemiological point of view, the diseases of plants and plant products caused by biotic agents (viruses, prokaryotes, fungi, parasitic phanerogams) and by abiotic factors, also investigating the basics anatomical and physiological mechanisms of pathogen aggression and plant resistance, and integrates the knowledge acquired in the design and development of diagnostic tools, strategies and defense techniques that respect the environment. The training skills concern phytopathological mycology and bacteriology, plant virology, pathology and pathophysiology of agricultural and forest plants and their products, non-parasitic diseases, phytoology, biological and integrated defense against diseases and phytopathological biotechnologies

Objectives:
The training objectives of the course aim to provide skills on precision feeding to ensure the satisfaction of nutritional needs in livestock species, as well as to study and analyze the main pathologies responsible for qualitative and quantitative decay of forage.

Propaedeuticities:
None
Is a propaedeuticity for:
None

Types of examinations and other tests:
Written and oral exam

Course:	Teaching Language:
Information technology for precision livestock farming ✓ Robotics ✓ Instrumentation and measurements for livestock farming	English

SSD (Subject area):	Credits:
ING-INF/04 – Automatics (Robotics)	4
ING-INF/07 – Electrical and Electronic Measurements (Instrumentation and measurements for livestock farming)	5

Course year:	Type of Educational Activity:
I	RELATED OR SUPPLEMENTARY

Teaching Methods:
in-person

Contents extracted from the SSD declaratory consistent with the training objectives of the course:
Dealing with topics concerning methods and technologies for information processing (data and signals) aimed at the automation of plants, processes and dynamic systems in general. This includes, for example, industrial production processes, automatic operating machines, transport systems, energy production systems, avionics systems and environmental systems. Despite the physical-structural differences that exist between these types of systems, the various process classes mentioned above nevertheless lend themselves to being represented, modelled and simulated, and finally managed and controlled, using methodological tools that are largely invariant with respect to the particular application domain considered. On the basis of this unifying approach, fields of competence of a general methodological nature are developed, as well as those oriented towards the study and treatment of problems of interest and commitment of the sector with more relevant technological content. In addition, research fields and theoretical-applicative skills proper to the science and technology of electrical and electronic measurements, as well as modern measurement instrumentation, are considered. Methodologies specific to the field concern the modelling and metrological characterisation of methods, components and systems for measurement; the extraction, interpretation and representation of measurement information. Research topics include the design, realisation and characterisation of methods, components and systems for measurement, with a focus on improving the metrological performance achieved. The fields of expertise cover both the 'objects' of scientific research, i.e. measurements and instruments, and the main scientific-application areas for which these objects are intended. Applications range from measurements in the area of information engineering to those aimed at quality improvement, industrial and environmental monitoring, and characterisation of materials, components and systems.

Objectives:
The educational objectives of the course aim to provide the theoretical and practical foundations of the measurement of physical quantities, the description, operating principles and metrological characteristics of the most common instruments for measuring electrical quantities (multimeters, oscilloscopes, etc.). It also aims to provide the basic knowledge in terms of the description and operating principles of sensors and actuators, the essential organs of a robotic system, as well as the characteristics of the main communication protocols used in the IoT (Internet of Things) environment. Finally, it aims to provide the minimum tools for the implementation of a simple use case in the context of Smart Agriculture.

Propaedeuticities:
None
Is a propaedeuticity for:
None

Types of examinations and other tests:
Oral exam – project discussion – laboratory discussion

Course:	Teaching Language:
Big data approach and analysis ✓ Statistical process control ✓ Livestock farming through Artificial Intelligence	English

SSD (Subject area):	Credits:
SECS-S/01 – STATISTICS (Statistical process control)	5
ING-INF/05 – INFORMATION PROCESSING SYSTEMS (Livestock farming through Artificial Intelligence)	3

Course year:	Type of Educational Activity:
I	MANAGEMENT AND SUSTAINABILITY DISCIPLINES - RELATED OR SUPPLEMENTARY

Teaching Methods:
in-person

Contents extracted from the SSD declaratory consistent with the training objectives of the course:
The course addresses issues relating to data analysis, the design and implementation of investigations and experiments in different application sectors, for descriptive, interpretative and decision-making purposes. It therefore includes the theoretical and methodological developments of descriptive, exploratory and inferential statistics in their various articulations such as mathematical statistics, sample theory, experimental design, statistical analysis of multivariate data, statistical analysis of time and space series; the modern problems relating to the management and processing of data are an integral part of these developments.
The sector is characterized by the set of scientific fields and scientific-disciplinary skills related to the design and implementation of information processing systems, as well as their management and use in various application contexts with engineering methodologies and techniques. This area includes the theoretical foundations, methods and technologies aimed at producing technically valid projects, from the point of view of both the adequacy of the proposed solutions and the possibility of technical implementation, as well as economic convenience and organizational effectiveness. These foundations, methods and technologies cover all aspects related to a processing system, from hardware to software, from operating systems to computer networks, from databases to information systems, from programming languages to software engineering, from human-machine interaction to signal and image recognition, multimedia processing, knowledge engineering, artificial intelligence and robotics. This sector also includes skills relating to the design and construction of IT systems and the various applications of processing systems, such as, for example, industrial telematics applications to socio-economic systems.

Objectives:
The training objectives of the Course aim to provide knowledge on innovative statistical tools, verify whether a theoretical model has an empirical foundation, estimate the parameters of a model and analyze a relationship between some variables. Decision models based on artificial intelligence would also be developed.

Propaedeuticities:
None
Is a propaedeuticity for:
None

Types of examinations and other tests:
Oral exam – Practical exercise

ANNEX 2.2

DEGREE PROGRAM DIDACTIC REGULATIONS

PRECISION LIVESTOCK FARMING

CLASS LM-86

School: Agriculture and Veterinary Medicine

Department: Veterinary Medicine and Animal Production

Regulations in force since the academic year 2022-2023

<table>
<tr><td colspan="2">Training Activity:
Training (under Art. 10, c. 5, letter d)</td><td colspan="2">Training Activity Language:
English</td></tr>
<tr><td colspan="3">Content of the activities consistent with the training objectives of the course:
Training ……</td><td>CFU:
6</td></tr>
<tr><td colspan="3">Course year:
I – II</td><td>Type of Training Activity: F</td></tr>
<tr><td colspan="4">Teaching Methods:
In-person</td></tr>
<tr><td colspan="4">Objectives:
Through the internship and placement activities, the student firstly completes and improves his/her training with a purely practical approach and also acquires the necessary ability to judge and operate autonomously, finding himself/herself for the first time interfacing with the reality of the working world.
The knowledge acquired throughout the course of study is applied practically both in the company Improsta, where the lessons of the Master Degree Course will take place, and in the laboratories of the University of Naples Federico II, as well as in various companies, public and private farms and professional orders under an agreement with the University. During the internship, the student will acquire fundamental skills, such as the ability to work in a team and a practical approach to problems. At external structures, the student in PLF will use the knowledge acquired during his/her course of study to understand and analyse the main company problems, trying to ensure their resolution through innovative and multidisciplinary approaches. The knowledge acquired during the training course will also be applied for the preparation and implementation of degree theses.</td></tr>
<tr><td colspan="4">Propaedeuticities:
None

Is a propaedeuticity for:
None</td></tr>
<tr><td colspan="4">Types of examinations and other tests:
Suitability</td></tr>
</table>