



# SOFT VETS

Pan-European soft skills curriculum for undergraduate veterinary education – „SOFTVETS”

## Soft\* skills curriculum for implementation in veterinary higher education

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SOFT\* SKILLS CURRICULUM FOR IMPLEMENTATION IN VETERINARY HIGHER EDUCATION

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## Description

This document provides you with information on a life skills curriculum for use in veterinary higher education. It is suitable for application in most institutions of veterinary higher education in different European countries.

After an introduction to the topic and presenting the method in developing the curriculum, curricula for the following three areas are presented:

1. Communication skills
2. Entrepreneurship skills
3. Digital skills

Each subsections includes a list of courses, learning outcomes for each course, recommended teaching methods and evaluation procedures.

The curriculum explicitly addresses life skills besides professional skills, and was developed by fostering partnerships between institutions of higher education, students, accreditation authorities and the labor market in order to define competencies, learning outcomes and teaching methods suitable for the intended goals.

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\*During the course of our project the project team has adapted to the updated terminology, according to the LifeComp framework, by using the term "life" instead of "soft" skills in all outputs.

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## Instruction

In the following section we, as the SOFTVETS consortium, present the model of a "Pan-European soft\* skills curriculum for undergraduate veterinary education".

Recent research and surveys among veterinarians showed an increasing need for enabling veterinarians with skills to cope with challenges imposed on them by the ever-changing world and the enormous strain the profession puts on them (1). It is recognised that the veterinary profession is one of the most stressful professions (1,2). Graduating students face an intensive working environment once they have come out into the labour market. Skill acquisition and development are essential for the performance and modernization of the profession in order to provide new forms of flexibility and security for veterinary professionals. The importance of teaching life skills to veterinary professionals has been recognized in the last 20 years; nevertheless, the methods and level of such education vary in veterinary schools around the world. Industry professionals value life skills and in a competitive environment for employees, it will be important to prepare students to become "industry ready" graduates (3).

Therefore, the target group of this project were students of veterinary medicine that need to be better prepared for real-life challenges in their future working environment, as well as veterinary teachers responsible for preparing them for their professional future.

The project teams' specific goal was to create a framework, and produce an ideal version of the new life skills curriculum that would be applicable in veterinary higher education throughout Europe. Recognising and respecting the diversity of educational strategies and curricular approaches found in European veterinary curricula, the project team took a learning-outcome based approach to the teaching of life skills; this was further supported by an appropriate syllabus. This approach seemed the most appropriate version to make the proposed learning outcomes attainable. In deciding not to produce an ideal version of the curriculum, the team developed a modular model from which each institution can take parts to insert into their own existing curricula. Of course, for those institutions that still haven't implemented teaching of life skills, the whole model curriculum is at their disposal for implementation.

As the purpose of the curriculum was to cover a wide range of life skills to cover all aspects of modern day challenges, it is organized in three sections: communication, entrepreneurship and digital skills.

The project team first developed a set of competences in a **SOFTVETS Competence model (Intellectual Output 1)**. The SOFTVETS Competence model was derived after an iterative consultation process including veterinary experts, as well as experts within the field of the addressed competence areas. The SOFTVETS competence model is prepared for veterinary teachers, teacher trainers, students as well as faculty and regulating bodies. The aim was to produce a document that would aid the implementation or integration of the list of recommendations of life skills competences in veterinary education. Faculty and Teachers can apply this model when developing competence-based life skills education in their own institution or curricula. Students can refer to the list to set their own learning goals in order to be optimally prepared for their future career.



The project team also developed **Intellectual Output 3: Training concept for education of teachers**. The SOFTVETS Training concept is prepared for veterinary teachers involved in life skills teaching at different higher education institutions (HEIs). It is aimed to teachers and/or institutions planning to incorporate teaching competence-based skills in their own syllabi or as an upgrade of an existing course. The templates of training concepts need to be adapted to local circumstances, facilities and possibilities.

The templates contain competences recommendations for teachers, intended learning outcomes, recommendations of teaching tools, techniques for adapting teaching methods for different scenarios, settings and outcomes and help to encourage the use of new teaching techniques of soft skills in effective communication with students.

The training concepts can be used in two ways. Firstly, Trainers can educate the professors who teach veterinary subjects and upgrade their teaching with skills to implement into their "professional" courses; Secondly, the training can focus on increasing the toolbar and methodology of teachers who already teach some of the soft skills. Trainers can be either local or international external experts or a veterinarian who is using the skills at a high level. The templates are planned for a 3-day-long course, but the timing and duration can and should be adapted to local circumstances.

The final document developed by SOFTVETS project team was **Intellectual Output 4: Evaluation Tools**. The SOFTVETS Evaluation Questionnaire for Students and the SOFTVETS Reflection Questionnaire for Teachers were developed for higher education institutions that aim at evaluating competence-based courses.

The SOFTVETS Reflection Questionnaire for Teachers can be used in two different ways, either as an additional feedback to the management or as individual reflection for teachers. If the Reflection Questionnaire is used as

an additional feedback to the management, the teacher's perspective complements the students' perspective, which can be helpful in developing and implementing quality assurance and improvement measures. It is meant to be used as a template and re-designed within the evaluation tool or platform that the institutions are most familiar with.







## Building a Curriculum

### 1. Defining intended competences was finished through the process of creating IO1

With a clear need for establishing soft skills competences for veterinary curricula the team created an extensive list of potential competences students should obtain by the end of their undergraduate studies.

### 2. Defining the learning outcomes for each competence area

Using various quantitative and qualitative methods of data collection and processing (analysis of the relevant curricula collected among EU establishments, literature research, expert inputs, Delphi technique) the lists of learning outcomes were built for communication, digital and entrepreneurial competence area. Learning outcomes corresponded to intended levels of competence. The learning outcomes describe what the student will know and understand after fulfilling his / her duties on the course. Blooms taxonomy was used as a basic method, as well as SMART Scheme: Specific, Measurable, Agreed, Relevant and time specific (Testable). A group of project experts revised the suggested learning outcomes using the Delphi technique. During this process the range of the questions and answers were discussed, and the final version of the learning outcomes was established.

### 3. Overlaps and differences in European curricula

After discussing the gaps and overlap within existing courses at different veterinary HEI and having in mind the diversity of educational strategies and curricular approaches found in European veterinary education curricula, we came to the conclusion to take the learning-outcome based approach to the teaching of life skills. This approach strives towards making our proposed curriculum attainable meaning that it will ultimately be up to each veterinary college to decide how to incorporate the proposed competences and learning outcomes into their curriculum and how the subjects are taught, bearing in mind that all veterinary education must meet certain EU standards.

### 4. Revisions of the document

Revisions of the Curriculum took place in the final months of the project, after the implementation phase.



## The learning outcomes

The aim of our project team, together with external experts was to identify learning outcomes relevant to life skills education using the Delphi consensus methodology, in three competence areas.

Delphi technique is a recognized method of harnessing expert opinion to reach consensus where absolute evidence is scant or lacking [4]. There is a simultaneous exploration of both similarities and differences of opinion. The experts are giving their opinion out anonymously, which diminishes bias and allows for equality in consideration of different ideas and opinions [5].

The Delphi technique uses a group of experts to filtrate a consensus on a certain matter by collating, sorting and summarizing responses to questions presented to them in various forms of questionnaires. Then this information is brought back to the contributors for further feedback, in hope that the team of experts will reach a consensus on a specific matter or set of tasks. There is precedent for its use in successful development of learning outcomes in both undergraduate and postgraduate veterinary education: specifically anchoring the outcomes with sound educational principles [6,7].

### Procedure

The process involved three separate sequential phases:

#### Delphi Round 1: Acquiring Learning Outcomes

A list of learning outcomes (LO's) that are in use in the curricula of EAEVE member veterinary schools for each of the three competence areas, were assembled from their SER's or gathered through a direct contact with teachers or educational representatives of veterinary schools by VEFUNIZG project team members.

#### Analysis of original LO's

The initial list of learning outcomes and teaching material was discussed by the project team members and categorized in various ways by experts within respective competence area. LO's deemed to be not specific or not applicable mainly or solely to the specific competence area were removed at this stage during a live meeting. The remaining list of LO's were then analysed for repetition and consolidated into composite LO's by a dedicated researcher in each competence area.





### Delphi Round 2: Survey 1

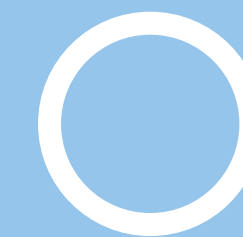
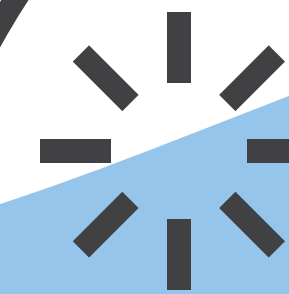
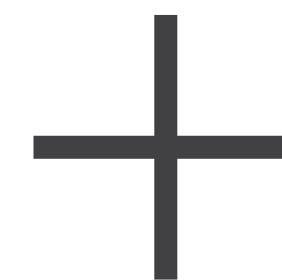
The LO's organized by the research team were presented to all experts within the expert team of each competence areas (usually between 3 and 5) through an email request. Experts were required to select the extent to which they thought each LO should be included in a communication/digital/entrepreneurship curriculum according to a 3-point scale (high / medium / low importance). A free text box was provided for comments or suggested amendments at the end of each competence area document.

### Analysis of Delphi Round 2: Survey 1

An a priori consensus standard was used that required 80% or greater of the panel stating they either "strongly agreed" or "agreed" with the inclusion of the LO in a life skills curriculum. LO's that achieved this standard were placed on the "Accepted LO" list. For some of these accepted LOs, edits were suggested, either from the Delphi panel or from the research team. Where this occurred, both the original and proposed edit were presented in Round 3 to selected experts to choose their preferred edit.

### Delphi Round 3: Survey 2

A further survey was created within an excel file and sent to a few selected experts within the project team to choose the final version of the edited LO's, after an online consultative meeting. This list of LO's was then deemed to be finalised.




**Learning objectives for SOFTVETS communication competences**

Acronym	Long name of the competence	Short name	
C1	Use nonverbal and paraverbal communication principles within the veterinary profession	Nonverbal communication	<p><b>Students at the end of the training will be able to:</b></p> <ul style="list-style-type: none"> <li>• Demonstrate ability to identify and use a wide range of non-verbal and para-verbal communication methods.</li> </ul>
C2	Show empathy in veterinary professional situations (understand, and relate to client's perspective and express empathic concern) Empathy	Empathy	<p><b>Students at the end of the training will be able to:</b></p> <ul style="list-style-type: none"> <li>• Demonstrate empathy towards clients, colleagues and animals and relate to the client's perspective.</li> <li>• Apply understanding of grief to clinical situations.</li> <li>• Communicate about and during the euthanasia of an animal, with respect for the emotions of the owners.</li> <li>• Evaluate the range of attachment people have for animals they care for.</li> <li>• Describe models of grief.</li> </ul>
C3	Reflect on own communication behavior, skills and limitations within the veterinary profession, as well as communication situations in general	Reflection	<p><b>Students at the end of the training will be able to:</b></p> <ul style="list-style-type: none"> <li>• Identify and develop own communication skills to deal with a range of challenging situations such as when clients are angry, distressed, grieving or in conflict etc..</li> <li>• Develop written communication skills to produce accurate and well-presented clinical records, reports and information materials.</li> <li>• Be able to keep track of own progress and develop concrete measures for professional and/or personal development based on individual conclusions.</li> <li>• Evaluate the quality of interpersonal communication (giving and receiving feedback).</li> <li>• Determine the role and basic principles of communication in veterinary profession.</li> <li>• Apply basic principles of communication in veterinary profession.</li> <li>• Assess concrete communication situations.</li> <li>• Correctly transfer the concepts of intrapersonal, interpersonal, verbal, nonverbal, social and media communication relevant for veterinary profession.</li> </ul>




**Learning objectives for SOFTVETS communication competences**

Acronym	Long name of the competence	Short name	
C4	Actively regulate one own's emotion, behavior and cognition within the veterinary profession, as well as in stressful communication situation	Self-regulation and self-care	<p><b>Students at the end of the training will be able to:</b></p> <ul style="list-style-type: none"> <li>• Demonstrate ability to manage own emotions in challenging situations.</li> <li>• Communicate effectively with emotionally stressed communication partners.</li> <li>• Reflect the influence of emotions on communication with carers of animals and with other communication partners.</li> <li>• Describe the most common emotions (fear, worry, shock, anger, sadness) in oneself and communication partners.</li> </ul>
C5	Check and ensure accurate understanding by active listening (receiving, attending, and assigning meaning) and react accordingly in veterinary profession	Active listening	<p><b>Students at the end of the training will be able to:</b></p> <ul style="list-style-type: none"> <li>• Analyse the skills needed for active listening.</li> <li>• Apply skills of active and empathic listening (being present, open and closed questions, facilitation, paraphrasing, reflection, exploration, summarising).</li> <li>• Treat humans and animals with respect.</li> <li>• Recognize, reflect and integrate perspective of communication partner and also one own's perspective.</li> </ul>
C6	Communicate veterinary profession topics clearly and in a structured way with clients (gathering and giving information, consultation)	Structured communication	<p><b>Students at the end of the training will be able to:</b></p> <ul style="list-style-type: none"> <li>• Select well-defined and routine digital tools and technologies for collaborative processes</li> <li>• Participate in the production of digital resources.</li> <li>• Use digital technologies for collaborative learning/work.</li> <li>• Promote the use of digital technologies to present cooperative forms of learning/work.</li> <li>• Use digital technologies for peer evaluation.</li> <li>• Engage individually and collectively in some cognitive processing to understand and resolve well-defined and routine conceptual problems and problem situations in digital environments.</li> </ul>




**Learning objectives for SOFTVETS communication competences**

Acronym	Long name of the competence	Short name	
C7	Recognize sensitive topics in veterinary profession and communicate appropriately in difficult or challenging situations	Difficult interactions	<p><b>Students at the end of the training will be able to:</b></p> <ul style="list-style-type: none"> <li>• Apply principles of effective communication within challenging situations to achieve a successful outcome.</li> <li>• Communicate in a respectful and appropriate way with people across culture, age, social background etc.</li> <li>• Recognize and reflect on own conscious and unconscious biases.</li> </ul>
C8	Communicate veterinary profession topics clearly and appropriately within an interprofessional and/or intercultural team	Communication in teams	<p><b>Students at the end of the training will be able to:</b></p> <ul style="list-style-type: none"> <li>• Demonstrate ability to respectfully deliver and receive constructive and effective feedback.</li> <li>• Apply theories of effective teamwork to professional situations.</li> <li>• Reflect and demonstrate effective team-communication skills (sharing information, negotiating, shared decision-making).</li> <li>• Demonstrate ability to communicate effectively with colleagues of all levels.</li> <li>• Describe and implement the principles of professional communication in interaction with graduate/employer.</li> </ul>
C9	Communicate veterinary profession topics clearly and appropriately with veterinarians as well as external stakeholders (e.g. professional colleagues, responsible authorities)	Networking and communication with stakeholders	<p><b>Students at the end of the training will be able to:</b></p> <ul style="list-style-type: none"> <li>• Demonstrate ability to communicate with various stakeholders, including both governmental and private organizations.</li> </ul>





## Learning objectives for SOFTVETS digital competences

Acronym	Long name of the competence	Short name	Cognitive	Practical
D1	Search data and veterinary profession content in digital environments (information systems, databases, access, navigation, search strategies)	Search for data	<p><b>Students at the end of softvets training will be able to:</b></p> <ul style="list-style-type: none"> <li>• Identify and explain information needs and potential sources of information (e.g., scholars, organizations, governments, industries).</li> <li>• Identify and use different search engines with digital resources.</li> <li>• Identify how information systems are organized in order to access relevant information.</li> <li>• Distinguish between the different search engines with digital resources</li> <li>• Create appropriate search strategies for identifying digital resources</li> <li>• Refine information need and search strategies based on results.</li> <li>• Apply different searching language types (e.g., controlled vocabulary, keywords)</li> </ul>	<p><b>Students will be able to:</b></p> <p>Name websites, blogs and digital databases they routinely access on their computer in order to consult literature for their homework.</p> <p>Use and explain well-defined keywords to find literature resources in websites, blogs and digital databases, and explain how they access and navigate between the results they find.</p> <p>Fix problems such as identifying that they have accessed the wrong website, or that they are navigating away from their routinely-used websites.</p> <p>Organise their own search strategy to find websites, blogs and digital databases containing literature/data related to their report topic.</p>
D2	Evaluate digital content used in veterinary profession (credibility, reliability of sources)	Evaluation of digital content	<p><b>Students at the end of softvets training will be able to:</b></p> <ul style="list-style-type: none"> <li>• Critically evaluate the credibility and reliability of digital resources</li> <li>• Evaluate the usability of digital resources for achieving the learning objectives and the competence levels</li> <li>• Identify and classify sources of information for validity according to the source.</li> <li>• Perform the analysis, comparison and evaluation of the credibility and reliability of well-defined sources of data, information and digital content.</li> <li>• Perform the analysis, interpretation and evaluation of well-defined data, information and digital content</li> </ul>	<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"> <li>• (Through the use of a concept map) list reasons why web pages (resources) should be evaluated for their validity and effectiveness.</li> <li>• Evaluate and rank a variety of web pages (resources) based on the criteria on a given rubric.</li> <li>• Summarize pros and cons of each website (resource) that is evaluated.</li> <li>• Work with partners to distinguish between one web site (resource) that is valid and reliable and one site (resource) containing non reliable sources.</li> </ul>


**Learning objectives for SOFTVETS digital competences**

Acronym	Long name of the competence	Short name	Cognitive	Practical
D3	Organise, store, retrieve and create digital content used in veterinary profession	Managing digital content	<p><b>Students at the end of softvets training will be able to:</b></p> <ul style="list-style-type: none"> <li>• Select data, information and content in order to organise, store and retrieve in digital environments</li> <li>• Organise data in a routine way in a structured environment.</li> <li>• Create and manage existing digital resources, where permitted</li> <li>• Combine and intertwine existing digital resources or their parts, where permitted</li> <li>• Combine and interconnect digital resources</li> </ul>	<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"> <li>• Indicate ways to create and edit well-defined and routine content in well-defined and routine formats,</li> <li>• Express themselves through the creation of well-defined and routine digital means.</li> <li>• Explain ways to modify, refine, improve and integrate well-defined items of new content and information to create new and original ones.</li> </ul>
D4	Handle copyright issues and licencing of digital content used in veterinary profession deliberately	Copyright and licences	<p><b>Students at the end of softvets training will be able to:</b></p> <ul style="list-style-type: none"> <li>• Trace the basic history of copyright</li> <li>• Explain general copyright terms</li> <li>• Explain the purpose of the copyright</li> <li>• Understand key characteristics of licenses</li> <li>• Understand Creative Commons licencing principles</li> <li>• Consider copyright while using existing digital resources</li> <li>• Consider copyright while creating different digital resources</li> </ul>	<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"> <li>• Find different web resources and recognize their copyrights and licences</li> <li>• Create new resources and provide appropriate Creative Common licence for the new resource</li> <li>• Properly cite resources that are protected with copyright for distributing or publishing on-line</li> <li>• Use different online resources with free digital materials</li> </ul>







## Learning objectives for SOFTVETS digital competences

Acronym	Long name of the competence	Short name	Cognitive	Practical
D5	Protect digital content used in veterinary profession (privacy and devices, digital risks, tools, techniques for digital safety and security)	Digital safety and security	<p>Students at the end of softvets training will be able to:</p> <ul style="list-style-type: none"> <li>• Understand different security terms (e.g. cybercrime, confidentiality, integrity, malware)</li> <li>• Understand the reasons for protecting workplace information on computers and devices (e.g. preventing theft, fraudulent use, accidental data loss, sabotage etc.)</li> <li>• Understand how anti-virus software works and the importance of regularly updating software</li> <li>• Understand and identify measures for preventing unauthorised access to data</li> <li>• Understand and recognise good password policies</li> <li>• Understand the importance of having a backup procedure and identify its features</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>• Recognise malicious, accidental threats to data from individuals, service providers, external organisations</li> <li>• Recognise threats to data from using cloud computing</li> <li>• Recognise types of infectious malware, ways that malware can be concealed on devices and understand how they work like</li> <li>• Identify possible fraudulent e-mail, unsolicited e-mail</li> <li>• Identify common methods of permanently deleting data</li> </ul>
D6	Share digital content in veterinary profession (principles, rights, risks) appropriately through digital technologies)	Sharing through digital technologies	<p>Students at the end of softvets training will be able to:</p> <ul style="list-style-type: none"> <li>• Recognise appropriate digital technologies to share data, information and digital content.</li> <li>• Understand how to act as an intermediary for sharing</li> <li>• Understand working with data clouds</li> <li>• Understand the advantages, limitations of encryption for data sharing.</li> <li>• Be aware of the importance of not disclosing or losing the encryption password, key, certificate.</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>• Manipulate appropriate digital technologies to share data, information and digital content.</li> <li>• Explain how to act as an intermediary for sharing</li> <li>• Encrypt a file, folder, drive before sharing.</li> <li>• Set a password for files like: documents, spreadsheets, compressed files</li> </ul>





## Learning objectives for SOFTVETS digital competences

Acronym	Long name of the competence	Short name	Cognitive	Practical
D7	Create digital content in veterinary profession collaboratively (digital tools and technologies), innovative co-construction and co-creation of resources and knowledge	Collaborating through digital technologies	<p><b>Students at the end of softvets training will be able to:</b></p> <ul style="list-style-type: none"> <li>• Select well-defined and routine digital tools and technologies for collaborative processes</li> <li>• Participate in the production of digital resources.</li> <li>• Use digital technologies for collaborative learning/work.</li> <li>• Promote the use of digital technologies to present cooperative forms of learning/work.</li> <li>• Use digital technologies for peer evaluation.</li> <li>• Engage individually and collectively in some cognitive processing to understand and resolve well-defined and routine conceptual problems and problem situations in digital environments</li> </ul>	<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"> <li>• Use different digital tools and technologies to ask for well-defined information on the course/topic/problem</li> <li>• Engage in exercises that use digital tools and technologies (for example: simulations) to practice a veterinary problem.</li> <li>• Discuss the exercises/problems in chat with other students / coworkers</li> </ul>
D8	Create, manage, and protect a digital identity in veterinary profession (principles, digital tools)	Managing professional digital identity	<p><b>Students at the end of softvets training and at the end of their undergraduate study will be able to:</b></p> <ul style="list-style-type: none"> <li>• Understand the reasons for protecting personal information like: avoiding identity theft, fraud, maintaining privacy</li> <li>• Understand the term identity theft and its implications: personal, financial, business, legal.</li> <li>• Identify methods of identity theft like: information diving, skimming, pretexting</li> <li>• Understand the term digital signature</li> <li>• Learn about well-defined and routine ways to protect their personal data and privacy in digital environments,</li> <li>• Learn about well-defined and routine ways to use and share personally identifiable information while protecting themselves and others from damages.</li> <li>• Learn about well-defined and routine privacy policy statements of how personal data is used in digital services.</li> </ul>	<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"> <li>• Select the most appropriate way to protect their personal data (e.g. address, phone number), before sharing it on the school's / workplace's digital platform.</li> <li>• Distinguish between appropriate and inappropriate digital content to share it on their school's / workplace's digital platform, so that their privacy and that of their classmates are not damaged.</li> <li>• Assess whether the way their personal data are used on the digital platform is appropriate and acceptable as regards their rights and privacy.</li> <li>• Overcome complex situations that can arise with their personal data while on the digital platform, such as personal data is not used in accordance to the "Privacy policy" of the platform.</li> </ul>




**Learning objectives for SOFTVETS entrepreneurship competences**

Acronym	Long name of the competence	Short name	Cognitive	Practical
E1	Reflect own career goals in veterinary profession (motivation, aspiration) and being determined to take action	Motivation and determination	<p><b>Students at the end of training will be able to:</b></p> <ul style="list-style-type: none"> <li>• identify, act upon and reflect on their own needs, wants, interests, skills, strengths, weaknesses and goals</li> <li>• recognize and explain the role of economic and financial issues in personal and professional activities</li> <li>• discuss and value the need for further education and self-improvement with regard to professional activities</li> <li>• believe in their ability to achieve what they intend to</li> </ul>	<p><b>Students at the end of training will be able to:</b></p> <ul style="list-style-type: none"> <li>• experiment with their own skills and competences</li> <li>• plan career; actively search for and evaluate their individual career paths, setting goals</li> <li>• deal with feedback and reflect</li> <li>• deal with changes and uncertainty in general, but specifically in the labour market</li> </ul>
E2	Apply financial and economic principles in veterinary profession (estimation of costs and revenue, financial project management, evaluation of financial decisions))	Financial and economic literacy	<p><b>Students at the end of training will be able to:</b></p> <ul style="list-style-type: none"> <li>• Know and describe economic and financial concepts (market, revenue, cost, profitability, budget, cash-flow, taxation)</li> <li>• Recall basic terminology related to money</li> <li>• Recognize the basic principles of accounting and financial calculation</li> <li>• Discuss the economic consequences of animal diseases (direct and indirect costs, as well as non-financial consequences)</li> <li>• Identify the economic principles and applications in animal health policies (implications of surveillance, control or eradication programmes)</li> </ul>	<p><b>Students at the end of training will be able to:</b></p> <ul style="list-style-type: none"> <li>• Read income statements and balance sheets</li> <li>• Draw up a budget for veterinary activities (calculation of costs and setting price for goods and services)</li> <li>• Judge the cash-flow needs of veterinary activities</li> <li>• Estimate the main tax obligations of their operations</li> <li>• Estimate the economic viability of treatment or control programmes (cost-benefit analysis)</li> <li>• Reflect on broader economic consequences of animal health policies (effect on related markets – e.g. trade bans)</li> <li>• Identify public and private sources of funding</li> </ul>


**Learning objectives for SOFTVETS entrepreneurship competences**

Acronym	Long name of the competence	Short name	Cognitive	Practical
E3	<b>Recognize and exploit opportunities (develop and evaluate ideas) within the veterinary profession</b>	<b>Entrepreneurial mindset</b>	<p><b>Students at the end of training will be able to:</b></p> <ul style="list-style-type: none"> <li>• Describe the importance of keeping up to date with developments in veterinary science/ medicine and changes in markets</li> <li>• Be problem solving orientated</li> <li>• Explain the importance of professionalism</li> <li>• Develop ideas that create value for themselves and others</li> <li>• Improve existing products, services and processes so that they better meet their needs, or those of peers, patients, patient owners, and the society as a whole</li> <li>• Recognise the many forms of value that could be created through entrepreneurship, such as social, cultural or economic value</li> </ul>	<p><b>Students at the end of training will be able to:</b></p> <ul style="list-style-type: none"> <li>• Use the knowledge and understanding of the market and competitive environment to make opportunities to create value</li> <li>• Recognise challenges and identify needs in the veterinary environment</li> <li>• Identify personal, social and professional opportunities for creating value, both in existing organisations or by setting up a new business</li> <li>• Use tools to identify opportunities, threats and changes in the competitive environment</li> <li>• Analyse, synthesise, resolve problems and make decisions in the professional environment of the veterinary medicine</li> <li>• Analyse and create activity focused on increasing client satisfaction and on increasing the number of clients</li> </ul>
E4	<b>Make informed entrepreneurial decisions within the veterinary profession and deal with uncertainty</b>	<b>Decision making</b>	<p><b>Students at the end of training will be able to:</b></p> <ul style="list-style-type: none"> <li>• Recognize and interpret the economic and financial data necessary for decision making at the business level</li> <li>• Recall risks and consequences of the chosen solution in given circumstances</li> <li>• Explain the process of informed decision making</li> <li>• Discuss the concept of competing interests (e.g. animal owner, veterinarian and politician have different goals)</li> </ul>	<p><b>Students at the end of training will be able to:</b></p> <ul style="list-style-type: none"> <li>• Actively look for, compare and contrast different sources of information that help them reduce ambiguity, uncertainty, and risks in making decisions</li> <li>• Weigh up both the risks and the expected benefits of their business activities</li> <li>• Perform informed decision making</li> <li>• Identify other stakeholders' views</li> <li>• cope with uncertainty and ambiguity and are not afraid of making mistakes while trying new things</li> </ul>



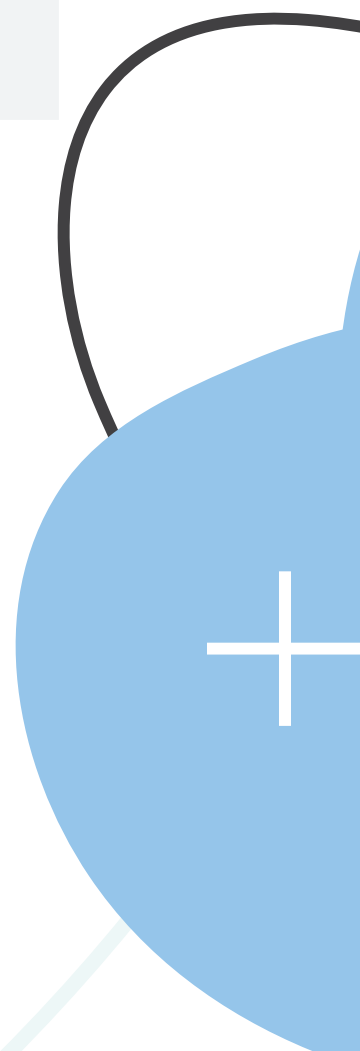

**Learning objectives for SOFTVETS entrepreneurship competences**

Acronym	Long name of the competence	Short name	Cognitive	Practical
E5	Mobilize entrepreneurial resources in veterinary profession by teamwork, networking and cooperation with external stakeholders	Mobilizing resources	<p><b>Students at the end of training will be able to:</b></p> <ul style="list-style-type: none"> <li>• Recognize the need for work with other professionals and networking</li> <li>• Identify and get together the necessary resources for their professional activities</li> <li>• Develop a plan for dealing with limited resources</li> <li>• Communicate with the external environment (e.g. customers, suppliers) as to economic conditions related to the professional activities</li> </ul>	<p><b>Students at the end of training will be able to:</b></p> <ul style="list-style-type: none"> <li>• Work in a (multidisciplinary) team and show respect, appreciation and sensitivity towards the work of others</li> <li>• Relate the information obtained during their professional work in a fluent way, spoken and written, to other colleagues, to the authorities and to society in general</li> <li>• Persuade others by providing a number of arguments and/or evidence</li> </ul>
E6	Apply leadership styles and advocate professional conduct of services, science and research in veterinary profession (for leading organizations, the self as well as others)	Leadership	<p><b>Students at the end of training will be able to:</b></p> <ul style="list-style-type: none"> <li>• Have basic knowledge of the profession, and the organization and operation of the professional practice in particular</li> <li>• Describe employee and employer rights and duties as outlined in the employment legislation</li> <li>• Discuss the importance of leadership for effective and productive work</li> <li>• Know leadership characteristics (listening, stewardship, empathy, foresight, building communities etc.)</li> </ul>	<p><b>Students at the end of training will be able to:</b></p> <ul style="list-style-type: none"> <li>• Pitch effectively in front of peers and stakeholders</li> </ul> <p><b>Inspire others, despite challenging circumstances</b></p> <ul style="list-style-type: none"> <li>• Lead a team</li> <li>• Think and act in an entrepreneurial way</li> </ul>
E7	Plan and manage business operations (define goals, establish action plans, consider risk management) within the veterinary profession	Business planning and Management	<p><b>Students at the end of training will be able to:</b></p> <ul style="list-style-type: none"> <li>• Make an effective diagnosis of the financial situation of a company and establish appropriate action plans</li> <li>• Define the key elements that make up a business model</li> <li>• Know the essence of the marketing concept and the principles of its application in particular types of organization</li> </ul>	<p><b>Students at the end of training will be able to:</b></p> <ul style="list-style-type: none"> <li>• Describe the different business models of veterinary practices</li> <li>• Identify and set goals</li> <li>• Know the basic principles of the analysis of the market environment and own resources of the organization</li> <li>• Know the basic principles of planning, organizing, motivating and controlling the organization and how to use them</li> <li>• Develop a business plan for their (veterinary) activities</li> <li>• Use basic marketing tools in everyday veterinary practice</li> </ul>

Learning objectives for SOFTVETS entrepreneurship competences

Acronym	Long name of the competence	Short name	Cognitive	Practical
E8	Initiate processes that create value or change, advance the veterinary profession and understand principles of creating new businesses, products or services	Innovation	<p>Students at the end of training will be able to:</p> <ul style="list-style-type: none"> <li>• Identify and describe the role and value of innovation in the profession</li> <li>• Tell the difference between types of innovation (e.g. process vs. product and social innovation, incremental vs. disruptive innovation)</li> <li>• Search and manage the information related to the professional activity</li> </ul>	<p>Students at the end of training will be able to:</p> <ul style="list-style-type: none"> <li>• Make a difference in service offered</li> <li>• Adjust his/her activities to changing market, knowledge and environment</li> <li>• Act in a free market, to lead the veterinary service to success and increase in the number and value of clients serviced</li> <li>• Be proactive</li> </ul>
D9	Consider consequences of entrepreneurial actions in veterinary profession regarding One Health and animal welfare, environment, society as well as evaluate sustainability and long-term effects	Ethics and sustainability	<p>Students at the end of training will be able to:</p> <ul style="list-style-type: none"> <li>• Recognise behaviours that show integrity, honesty, responsibility, courage and commitment</li> <li>• Maintain ethical behaviour towards the profession and to society when exercising their responsibilities</li> <li>• Evaluate different legislations of different countries and make relevant reports</li> </ul>	<p>Students at the end of training will be able to:</p> <ul style="list-style-type: none"> <li>• Recognise behaviours that show integrity, honesty, responsibility, courage and commitment</li> <li>• Maintain ethical behaviour towards the profession and to society when exercising their responsibilities</li> <li>• Evaluate different legislations of different countries and make relevant reports</li> </ul> <p>Students at the end of training will be able to:</p> <ul style="list-style-type: none"> <li>• Interplay with other veterinary practices in an ethical and responsible way</li> <li>• Identify and discuss the impact their actions have on the target group, environment and society</li> <li>• Identify the positive and negative effects veterinarians' activities can have for the society and environment</li> </ul>

SOFT\* SKILLS CURRICULUM FOR IMPLEMENTATION IN VETERINARY HIGHER EDUCATION







## The Curriculum outline

For each course within the Curriculum, the syllabi for each competence area should contain:

Goal of the course

The overview of the course

Course content

Overview of course topics

Detailed information for each topic on

- Content
- Intended Learning Outcomes\* (a selection)
- Learning and teaching methods
- Ratio between lectures and practical training
- Assessment methods

## The syllabi

### A. COMMUNICATION SKILLS IN VETERINARY MEDICINE

Communication is a core clinical skill [8]. Furthermore, communication is a set of learned skills that needs to be taught [9]. The quality of communication between veterinarian and patient owner is of great importance for client's loyalty [10] and satisfaction [11], but also for the outcome of the consultation [12]. Lack of communicative competence of the veterinarian is a



common cause of complaints and errors [13]. Therefore, teaching, learning and assessment of communication competence within veterinary undergraduate studies is essential [14].

### Goal

The main goal of this course is for students to acquire the understanding and practice of the professional communication associated within the veterinary profession.

The objectives of the course are:

- a) To provide students with theoretical and practical tools as well as knowledge of communication in veterinary medicine that will be useful in professional practice.
- b) Address content and increase the communication skills at interpersonal, institutional and media level.
- c) Understand concepts that serve as a basis for effective communication between veterinarians and patient owners, among veterinarians themselves, as well as communication with the other publics.

### The overview of the course:

- Students will be able to reflect upon and increase their communication skills and create a lasting veterinarian/animal owner rapport.
- They will also be able to provide a structured diagnosis, prognosis and treatment plan.
- Students will be able to treat humans and animals with respect.
- Students will be able to put themselves in the position of both the animal owner and the veterinarian, thereby getting and giving structured and relevant feedback.







- Students will be able to apply principles of effective communication within challenging situations.
- Students will be able to collaborate more effectively in working teams.
- Students will become better public speakers in different settings (business, media, academic etc.).

The following descriptions comprise 6 topics with the help of which the ten communication competence areas identified in the context of the present project can be conveyed. These can be put together individually depending on the requirements and circumstances of the educational institution and varied according to the number of available teaching hours. They are suggestions that can be of help while developing curricula for your respective communication skills syllabus.

## The topics are:

Topic 1: Basic interpersonal communication skills theory & practice

Topic 2: Framework for veterinary medical consultations: Calgary Cambridge Guide

Topic 3: "Difficult"/challenging consultations

Topic 4: Teamwork and leadership

Topic 5: Basics of media/digital communication and public speaking

Topic 6: Basics of communication with external stakeholders

## Topic 1: Basic interpersonal communication skills theory & practice

The aim of the topic is to provide students with an overview of effective verbal and nonverbal communication skills in relation to clients and colleagues.

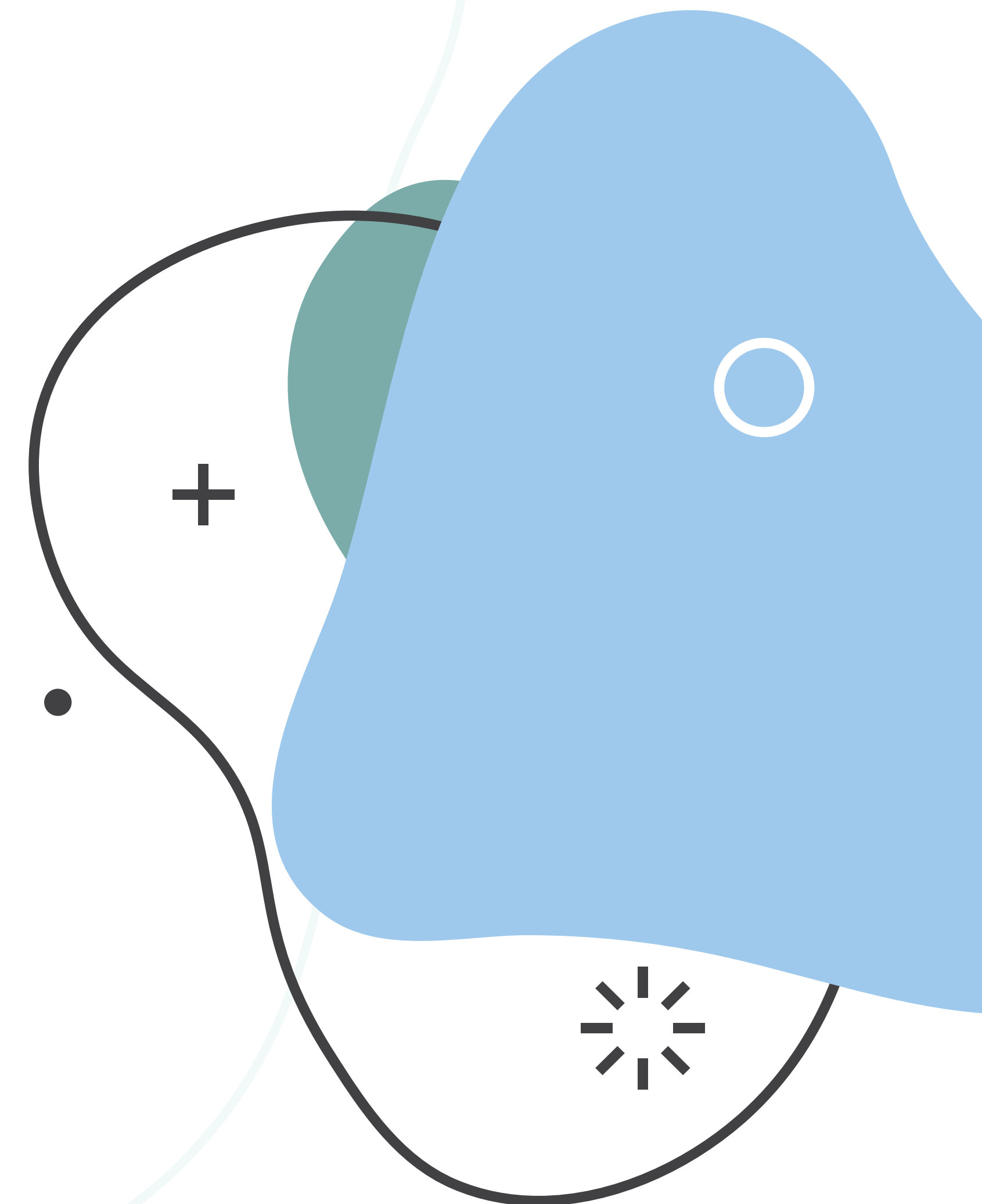
<b>Content</b>	<ul style="list-style-type: none"> <li>• Determine the role and basic principles of communication in the veterinary profession</li> <li>• Understanding of basic concepts of communication and the specifics of the communication between the veterinarian and animal owner</li> <li>• Active listening</li> <li>• Non-verbal communication</li> <li>• Empathy</li> </ul>
<b>Intended Learning Outcomes</b>	<ul style="list-style-type: none"> <li>• Apply basic principles of communication in veterinary profession.</li> <li>• Analyse and develop the skills needed for active listening.</li> <li>• Recognize, reflect and integrate perspective of communication partner and also one's own perspective.</li> <li>• Recognize and reflect on one's own conscious and unconscious biases.</li> <li>• Demonstrate ability to identify and use a wide range of non-verbal and paraverbal communication skills.</li> <li>• Transfer the concepts of intrapersonal, interpersonal, verbal, nonverbal, social, and media communication relevant for the veterinary profession.</li> </ul>
<b>Learning and teaching methods</b>	<ul style="list-style-type: none"> <li>• Interactive lectures</li> <li>• Discussions</li> <li>• Practical session(s) with video assignments</li> <li>• Self-reflection and peer feedback</li> <li>• Experiential exercises</li> </ul>
<b>Ratio lecture/practical training</b>	50/50
<b>Assessment methods</b>	<ul style="list-style-type: none"> <li>• Formative assessment (for example: quiz, documentation and results of the inquiry based learning)</li> </ul>



## Topic 2: Framework for veterinary medical consultations: Calgary Cambridge Guide

The aim of the topic is development of effective communication skills within the context of the veterinary consultation, integration of clinical and communication skills.

<b>Content</b>	<ul style="list-style-type: none"> <li>• Interview techniques: open and closed questions, paraphrasing, reflecting, exploring and summarizing</li> <li>• Calgary-Cambridge consultation model</li> <li>• Opening the consultation, exploration of the complaint/questions from the owner</li> <li>• Taking medical history (including social and life style information when relevant)</li> <li>• Explanation of diagnosis, prognosis and treatment</li> <li>• Closing the consultation</li> <li>• Telephone calls</li> </ul>
<b>Intended Learning Outcomes</b>	<ul style="list-style-type: none"> <li>• Describe and apply the basic principles of the structure of veterinary consultation (e.g. the Calgary-Cambridge consultation model).</li> <li>• Demonstrate the ability to elicit a comprehensive clinical history from a client or colleague.</li> <li>• Treat humans and animals with respect.</li> <li>• Apply principles of effective communication (active listening, summarizing, rapport building, avoiding jargon, using open/closed questions and displaying empathy) during encounters with clients and colleagues, with respect for confidentiality and privacy.</li> <li>• Check animal owners' perception and control if information was suitably perceived.</li> <li>• Develop written communication skills to produce accurate and well-presented clinical records, reports and information materials.</li> <li>• Create a lasting veterinarian/animal owner rapport.</li> </ul>
<b>Learning and teaching methods</b>	<ul style="list-style-type: none"> <li>• Direct instruction</li> <li>• Videos of VM consultations</li> <li>• Role play interactions</li> <li>• Observation and systematic reflection of consultation within a veterinary practice</li> </ul>
<b>Ratio lecture/practical training</b>	520/80
<b>Assessment methods</b>	<ul style="list-style-type: none"> <li>• Formative assessment (e.g., documentation of consultation attendance, assessment of consultation communication skills)</li> </ul>

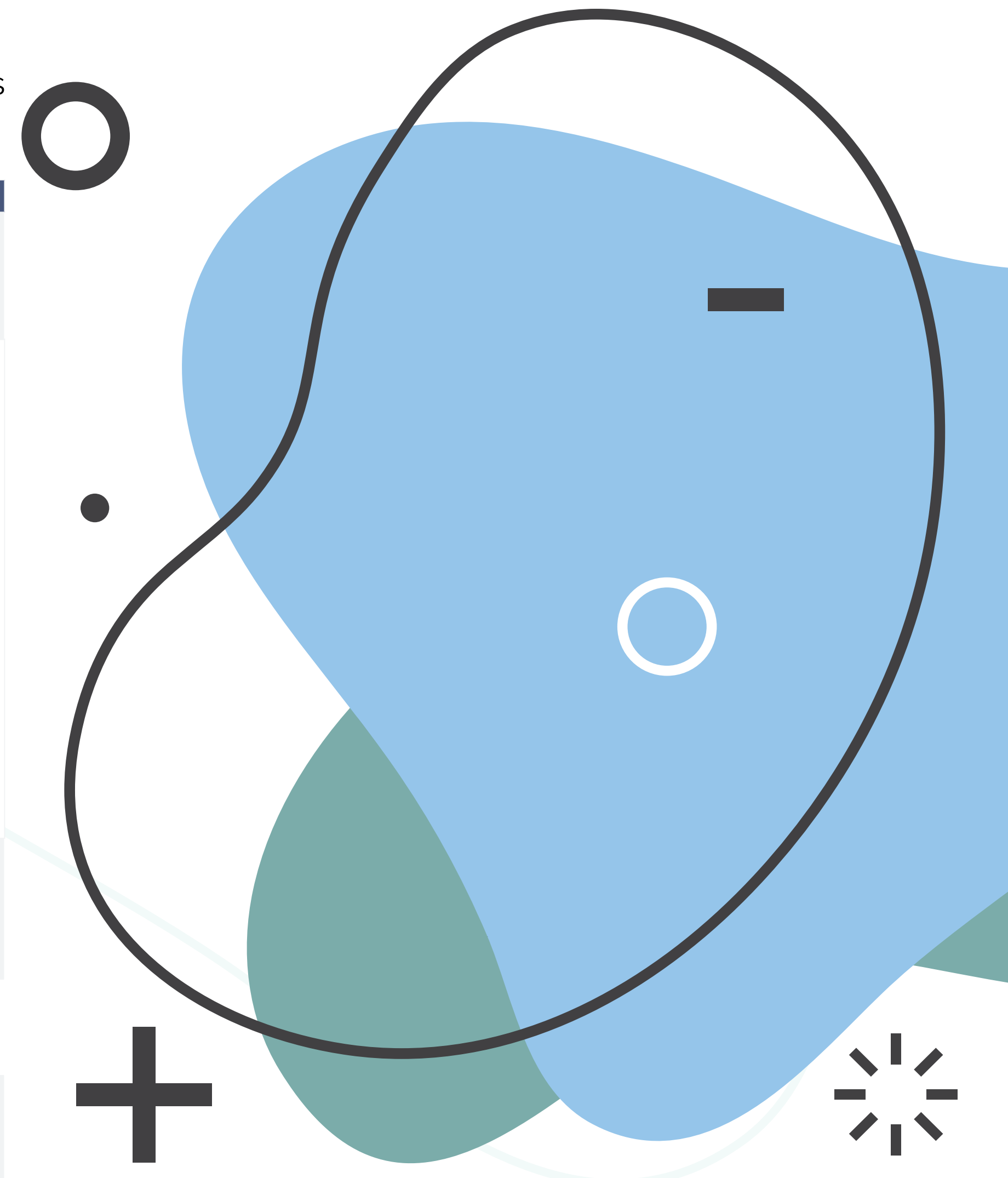




### Topic 3: "Difficult"/challenging consultations

The aim of this topic is development of effective communication skills in the context of challenging situations (e.g., euthanasia, emergency situation, bad news, complaints, monetary issues, ethical dilemmas etc.).

<b>Content</b>	<ul style="list-style-type: none"> <li>• Dealing with complaints</li> <li>• Communicating about ethical dilemmas</li> <li>• Communication about treatment fees</li> </ul>
<b>Intended Learning Outcomes</b>	<ul style="list-style-type: none"> <li>• Describe the most common emotions (fear, worry, shock, anger, sadness) in oneself and communication partners.</li> <li>• Reflect the influence of emotions on communication with carers of animals and with other communication partners.</li> <li>• Demonstrate ability to manage own emotions in challenging situations.</li> <li>• Demonstrate empathy towards clients, colleagues and animals and relate to the client's perspective.</li> <li>• Communicate effectively with emotionally stressed communication partners.</li> <li>• Evaluate the range of attachment people have for animals they care for.</li> <li>• Apply understanding of grief to clinical situations.</li> <li>• Describe models of grief.</li> <li>• Communicate about and during the euthanasia of an animal, with respect for the emotions of the owners.</li> <li>• Communicating in emergency situations.</li> <li>• Communicate in a respectful and appropriate way with people across culture, age, social background etc.</li> </ul>
<b>Learning and teaching methods</b>	<ul style="list-style-type: none"> <li>• Practical assignment with simulated clients</li> <li>• Specific role plays with elaborated scenarios</li> <li>• Studying literature on specific topics</li> <li>• Interviews with veterinary practitioners (or their invited presentations)</li> </ul>
<b>Ratio lecture/practical training</b>	10/90
<b>Assessment methods</b>	<ul style="list-style-type: none"> <li>• Project work (seminar work on specific topics)</li> <li>• Formative assessment (e.g., assessment of communication skills in challenging situations)</li> </ul>







## Topic 4: Teamwork and leadership

The aim of this topic is development of team work and leadership.

<b>Content</b>	<ul style="list-style-type: none"> <li>• Teamwork</li> <li>• Leadership models</li> <li>• Conflict resolution</li> <li>• intercultural and diversity aspect</li> <li>• Reflection</li> <li>• Giving and receiving feedback</li> </ul>
<b>Intended Learning Outcomes</b>	<ul style="list-style-type: none"> <li>• Understand and explain how group process, group structure, and organizational context influence team effectiveness.</li> <li>• Apply theories of effective teamwork to professional situations.</li> <li>• Reflect and demonstrate effective team communication skills (sharing information, negotiating, shared decision-making).</li> <li>• Demonstrate ability to respectfully deliver and receive constructive and effective feedback.</li> <li>• Describe and implement the principles of professional communication in interaction with graduate/employer.</li> <li>• Assess your own qualities as a team member.</li> <li>• Understand fundamental ways how leadership is practiced in organisations.</li> <li>• Manage conflicts constructively.</li> <li>• Be able to keep track of own progress and develop concrete measures for professional and/or personal development based on individual conclusions.</li> </ul>
<b>Learning and teaching methods</b>	<ul style="list-style-type: none"> <li>• Direct instruction</li> <li>• Discussion</li> <li>• Experiential simulation exercises to explore teamwork dynamics (e.g. survival scenario)</li> <li>• Invited talks of alumni</li> <li>• Individual aptitude test</li> </ul>
<b>Ratio lecture/practical training</b>	30/70
<b>Assessment methods</b>	<ul style="list-style-type: none"> <li>• Project work</li> </ul>





### Topic 5: Basics of media/digital communication and public speaking

The aim of this topic is development of basic skills effective public communication and communication with media.

<b>Content</b>	<ul style="list-style-type: none"> <li>• Media communication</li> <li>• Public speaking (speaking to a big and/or anonymous audience)</li> </ul>
<b>Intended Learning Outcomes</b>	<ul style="list-style-type: none"> <li>• Increase basic understanding of media communication (including social media).</li> <li>• Understand communication concepts that serve as a basis for effective public speaking and media communication.</li> <li>• Develop verbal, nonverbal and research competencies for preparing and delivering presentations/messages in different settings (business, media, academic etc.).</li> <li>• Produce effective written communication in a variety of formats.</li> <li>• Gain confidence for public speaking and media communication.</li> </ul>
<b>Learning and teaching methods</b>	<ul style="list-style-type: none"> <li>• Direct instruction</li> <li>• Discussion</li> <li>• Preparation of a scientific presentation (lecture, poster)</li> <li>• Analysis of media communication veterinary cases and preparing one's own case</li> </ul>
<b>Ratio lecture/practical training</b>	30/70
<b>Assessment methods</b>	<ul style="list-style-type: none"> <li>• Project work</li> <li>• Project presentations</li> </ul>





## Topic 6: Basics of communication with external stakeholders

The aim of this topic is development of basic skills for effective communication with external stakeholders, e.g. professional colleagues, responsible authorities, etc.

<b>Content</b>	<ul style="list-style-type: none"> <li>• Communication customized to diverse stakeholders</li> </ul>
<b>Intended Learning Outcomes</b>	<ul style="list-style-type: none"> <li>• Demonstrate ability to communicate effectively with various stakeholders, including governmental and private organizations.</li> <li>• Demonstrate ability to determine stakeholders' understanding, interests, issues, and requirements.</li> <li>• Create a communications plan for all relevant stakeholders.</li> </ul>
<b>Learning and teaching methods</b>	<ul style="list-style-type: none"> <li>• Direct instruction</li> <li>• Discussion</li> <li>• Invited talks of key stakeholders in the veterinary field (alumni and other expert groups)</li> <li>• Project/problem/collaborative based learning (e.g. stakeholders identification, determination of prototypical stakeholder's position, tailoring messages/framing communication accordingly)</li> </ul>
<b>Ratio lecture/practical training</b>	40/60
<b>Assessment methods</b>	<ul style="list-style-type: none"> <li>• Project work</li> </ul>





## Literature & suggested reading for communication curriculum:

**Gray, C. & Moffett, J.** (2010) Handbook of Veterinary Communication Skills. Oxford: Wiley-Blackwell.

**Abood, S. K.** (2007) Increasing Adherence in Practice: Making Your Clients Partners in Care. *Veterinary Clinics: Small Animal Practice*, 37, 1: 151-164.

**Adams, C. L. & Frankel, R. M.** (2007) It may be a dog's life but the relationship with her owners is also key to her health and wellbeing: communication in veterinary medicine. *Veterinary Clinics: Small Animal Practice*, 37, 1: 1-17.

**Bateman, Shane W.** (2007) Communication in the Veterinary Emergency Setting. *Veterinary Clinics: Small Animal Practice*, 37, 1: 109-121.

**Brandt, Jennifer C.; Grabill, Chandra M.** (2007) Communicating with Special Populations: Children and Older Adults. *Veterinary Clinics: Small Animal Practice*, 37, 1: 181-198.

**Bishop GA, Long CC, Carlsten KS, Kennedy KC, Shaw JR.** The Colorado State University Pet Hospice program: end-of-life care for pets and their families. *J Vet Med Educ*. 2008 Winter;35(4):525-31.

**Cohen, Susan P.** (2007): Compassion Fatigue and the Veterinary Health Team. *Veterinary Clinics: Small Animal Practice*, 37, 1: 123-134.

**Cornell, Karen K.; Kopcha, Michelle** (2007) Client-Veterinarian Communication: Skills for Client Centered Dialogue and Shared Decision Making. *Veterinary Clinics: Small Animal Practice*, 37, 1: 37-47.

**Graaf, G.** (2005) Veterinarian Discourses on Animals and Clients. *Journal of Agricultural and Environmental Ethics*, 18, 6, 557-578.

**Klingborg, D. J. & Klingborg, J.** (2007) Talking with Veterinary Clients about Money. *Veterinary Clinics: Small Animal Practice*, 37, 1: 79-93.

**Kogan, L. R., Hazel, S. J., Oxley, J. A.** (2019) A pilot study of Australian pet owners who engage in social media and their use, experience and views of online pet health information. *Australian Veterinary Journal*, 97, 11: 433-439.

Küper, A. M. & Merle, R. (2019). Being Nice Is Not Enough-Exploring Relationship-Centered Veterinary Care With Structural Equation Modeling. A Quantitative Study on German Pet Owners' Perception. *Frontiers in Veterinary Science*, 6, 56.

**Morgan, C. A., McDonald, M.** (2007) Ethical Dilemmas in Veterinary Medicine. *Veterinary Clinics: Small Animal Practice*, 37, 1: 165-79.

**O'Connell, D. & Bonvicini, K. A.** (2007) Addressing Disappointment in Veterinary Practice. *Veterinary Clinics: Small Animal Practice*, 37, 1: 135-149.

**Ruby, K. L. & DeBowes, R. M.** (2007) The Veterinary Health Care Team: Going from Good to Great. *Veterinary Clinics: Small Animal Practice*, 37, 1: 19-35.

**Shaw, J. & Lagoni, L. (1997)** End-of-Life Communication in Veterinary Medicine: Delivering Bad News and Euthanasia Decision Making. *Veterinary Clinics: Small Animal Practice*, 37, 1: 95-108.

**Shaw, J., Bonnett B. N., Adams C. L., Roter D.L.** (2012) Gender Differences in Veterinarian-Client-Patient Communication in Companion Animal Practice. *Journal of the American Veterinary Medical Association*, 241, 1 81-88.

**Testoni, I., De Cataldo, L. Ronconi, L. Colombo, E. S., Stefanini, C. Dal Zotto, B. & Zamperini, A.** (2019) Pet Grief: Tools to Assess Owners' Bereavement and Veterinary Communication Skills. *Animals*, 9, 2.



## B. ENTREPRENEURSHIP SKILLS IN VETERINARY MEDICINE

The European Commission identified 'sense of initiative and entrepreneurship' as one of the eight key competences necessary for European citizens [15]. Similar to communication competences, "there is a growing awareness that entrepreneurial skills, knowledge and attitudes can be learned and in turn lead to the widespread development of entrepreneurial mind-sets and culture, which benefit individuals and society as a whole" [16, p.5]. Furthermore, "EntreComp defines entrepreneurship as a transversal competence, which applies to all spheres of life: from nurturing personal development, to actively participating in society, to (re)entering the job market as an employee or as a self-employed person, and also to starting up ventures (cultural, social or commercial)." [16, p.6]. Entrepreneurial skills are also seen as essential competences within the veterinary profession [17] and are identified as an indicator for career success [18]. They include a set of cognitive and practical skills applied individually or within a group setting. Employability, as well as being an employer in the future career are relevant for many veterinary graduates [19]. Furthermore, veterinarians are often involved in research and innovation, which leads to new technologies and products. Many competences that can be summarized within the area of entrepreneurship are relevant to the veterinary profession. Hence, they should be addressed within the veterinary education [19]. Initial approaches to integrate these skills within undergraduate veterinary education have been made [20], [21].

### Goal

The main goal of this course is to provide students with the basic understanding of the business side within the veterinary profession, i.e. introducing students to the basic concepts of entrepreneurship, financial and business management to prepare them for a successful career in the field of veterinary medicine.

#### Description of the course:

The curriculum is specifically designed for veterinarians, whether they will be self-employed, employed or working as employers in business, legislation or research. The basic theoretical knowledge, mindset and skills acquired in this course will equip them for the constantly changing market environment and promote their personal development and active participation in society.

### The objectives of the course are:

- To provide students with theoretical and practical tools as well as correct knowledge of entrepreneurship, innovation, business management, and in addition leadership, ethics, and sustainability in the veterinary profession that will be useful in professional practice.
- Address content related to the individual career planning in relation to trends and opportunities in the veterinary industry.
- Address content related to both prospective practice owners ("entrepreneurs") and future employees ("intrapreneurs").







### Instruction

The following descriptions comprise six topics that can be used to teach the nine entrepreneurship competence areas identified in the intellectual output 1 of the SOFTVETS project. These modules are suggestions for developing the respective curriculum for entrepreneurial skills. They can be put together individually depending on the requirements and circumstances of the educational institution and varied according to the number of available teaching hours.

The modules are:

- 1. Motivation and career**
- 2. Financial and economic literacy**
- 3. Business planning and strategy**
- 4. Leadership and business management**
- 5. Entrepreneurial mind-set and innovation**
- 6. Ethics and sustainability**

### Topic 1: Motivation and career

The aim of the module is to provide students with an overview of career choices and assisting them in identifying individual talents, interests and goals.

<b>Content</b>	<ul style="list-style-type: none"> <li>• Career choice and development</li> <li>• Personal strengths, weaknesses and goals</li> <li>• Trends in the veterinary profession</li> <li>• Continuing education</li> </ul>
<b>Intended Learning Outcomes</b>	<p><b>Cognitive</b></p> <ul style="list-style-type: none"> <li>• identify, act upon and reflect on their own needs, wants, interests, skills, strengths, weaknesses and goals</li> <li>• discuss and value the need for further education and self-improvement with regard to professional activities</li> <li>• believe in their ability to achieve what they intend to</li> </ul> <p><b>Practical</b></p> <ul style="list-style-type: none"> <li>• experiment with their own skills and competences</li> <li>• plan career; actively search for and evaluate their individual career paths, setting goals</li> <li>• deal with changes and uncertainty in general, but specifically in the labour market</li> </ul>
<b>Learning and teaching methods</b>	<ul style="list-style-type: none"> <li>• Direct instruction</li> <li>• Discussion</li> <li>• Invited talks by alumni representing various career paths</li> <li>• Individual aptitude test</li> </ul>
<b>Ratio lecture/practical training</b>	~80/20
<b>Assessment methods</b>	<ul style="list-style-type: none"> <li>• Individual career development plan</li> <li>• Reflection paper</li> </ul>
<b>Literature (suggestions)</b>	<ul style="list-style-type: none"> <li>• Sinek, S. (2011), Start with why.</li> <li>• FVE. Survey of the veterinary profession in Europe 2018 [Available from: <a href="https://www.fve.org/cms/wp-content/uploads/FVE_Survey_2018_WEB.pdf">https://www.fve.org/cms/wp-content/uploads/FVE_Survey_2018_WEB.pdf</a>]</li> </ul>



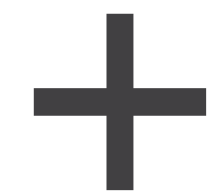




## Topic 2: Financial and economic literacy

The aim of this module is to familiarize students with the most important financial concepts and tools, regarding both business and private matters.

<b>Content</b>	<ul style="list-style-type: none"> <li>• Basic economic and financial concepts</li> <li>• Business finance</li> <li>• Financial statements</li> <li>• Revenue and expense streams</li> <li>• Accounting, bookkeeping and taxes</li> <li>• Investment planning and financing</li> <li>• Personal finance and budgeting</li> </ul>
<b>Intended Learning Outcomes</b>	<p><b>Cognitive</b></p> <ul style="list-style-type: none"> <li>• know and describe economic and financial concepts (market, revenue, cost, profitability, budget, cash-flow, taxation)</li> <li>• recall basic terminology related to money</li> <li>• recognize the basic principles of accounting and financial calculation</li> <li>• recognize and explain the role of economic and financial issues in personal and professional activities</li> </ul> <p><b>Practical</b></p> <ul style="list-style-type: none"> <li>• read income statements and balance sheets</li> <li>• draw up a budget for veterinary activities (calculation of costs and setting price for goods and services)</li> <li>• judge the cash-flow needs of veterinary activities</li> <li>• identify public and private sources of funding</li> <li>• estimate the main tax obligations of their operations</li> </ul>
<b>Learning and teaching methods</b>	<ul style="list-style-type: none"> <li>• Direct instruction</li> <li>• Discussion</li> <li>• Individual and group work</li> </ul>
<b>Ratio lecture/practical training</b>	70/30
<b>Assessment methods</b>	<ul style="list-style-type: none"> <li>• Formative assessment (e.g. quiz)</li> <li>• Group work (e.g. analysing or developing a budget for a veterinary practice)</li> </ul>
<b>Literature (suggestions)</b>	<ul style="list-style-type: none"> <li>• Chamblee, J., Reiboldt, M. (2014), Financial Management of the Veterinary Practice.</li> </ul>





## Topic 3: Business planning and strategy

The aim of this module is to develop knowledge about marketing and business strategy. This includes the importance of developing a well laid out business plan with a distinct strategy, SWOT analysis, marketing and financial plan.

<p><b>Content</b></p>	<ul style="list-style-type: none"> <li>• Business model and business planning (customer need, market, competitive and environmental analysis, product and price, strategy)</li> <li>• Marketing</li> <li>• Financial planning</li> <li>• Decision making process</li> <li>• Management of risk</li> </ul>
<p><b>Intended Learning Outcomes</b></p>	<p><b>Cognitive</b></p> <ul style="list-style-type: none"> <li>• define the key elements that make up a business model</li> <li>• develop a plan for dealing with limited resources</li> <li>• identify and get together the necessary resources for their professional activities</li> <li>• know the essence of the marketing concept and the principles of its application in particular types of organization</li> <li>• recognize the need for work with other professionals and networking</li> <li>• recognize and interpret the economic and financial data necessary for decision making at the business level</li> <li>• search and manage the information related to the professional activity</li> <li>• recall risks and consequences of the chosen solution in given circumstances</li> <li>• explain the process of informed decision making</li> <li>• discuss the concept of competing interests (e.g. animal owner, veterinarian and politician have different goals)</li> <li>• communicate with the external environment (e.g. customers, suppliers) as to economic conditions related to the professional activities</li> </ul> <p><b>Practical</b></p> <ul style="list-style-type: none"> <li>• describe the different business models of veterinary practices</li> <li>• develop a business plan for their (veterinary) activities</li> <li>• actively look for, compare and contrast different sources of information that help reduce ambiguity, uncertainty, and risks in making decisions</li> </ul>



### Intended Learning Outcomes

- weigh up both the risks and the expected benefits of their business activities
- perform informed decision making (analyse, synthesise, resolve problems and make decisions in the professional environment of the veterinary medicine)
- cope with uncertainty and ambiguity and are not afraid of making mistakes while trying new things
- know the basic principles of the analysis of the market environment and own resources of the organization use basic marketing tools in everyday veterinary practice
- analyse and create activity focused on increasing client satisfaction and on increasing the number of clients
- understand other stakeholders' views
- draw up a budget for veterinary activities (calculation of costs and setting price for goods and services)
- judge the cash-flow needs of veterinary activities
- estimate the main tax obligations of their operations
- identify public and private sources of funding
- pitch effectively in front of peers and stakeholders

### Learning and teaching methods

- Direct instruction
- Discussion
- Project based learning

### Ratio lecture/ practical training

50/50

### Assessment methods

- Formative assessment (e.g. quiz)
- Project work (e.g. business model, business plan)
- Project presentation

### Literature (suggestions)

- Finch, B. (2019), How to Write a Business Plan.
- Osterwalder, A., Pigneur, Y. (2010), Business Model Generation.
- Jones, M.D., Harbin, T. (2017), The Business Side of Veterinary Medicine: What Veterinary Schools Don't Teach You.
- Shilcock, M., Stutchfield, G. (2003), Veterinary practice management, a practical guide.
- Coates, C.R. (2012), Veterinary Practice Management.
- Chamblee, J., Reiboldt, M. (2014), Financial Management of the Veterinary Practice.







### Topic 4: Leadership and business management

The aim of this module is to provide insights into the management of veterinary business operations. This includes the functions of management, different types of leadership and human resources management.

<b>Content</b>	<ul style="list-style-type: none"> <li>• Business operations of a veterinary practice</li> <li>• Principles and functions of management</li> <li>• Leadership</li> <li>• Human resources (teams and organisation) and employment law</li> <li>• Recruitment, hiring, and termination</li> </ul>
<b>Intended Learning Outcomes</b>	<p><b>Cognitive</b></p> <ul style="list-style-type: none"> <li>• have basic knowledge of the profession, and in particular the organization and operation of the professional practice</li> <li>• make an effective diagnosis of the financial situation of a company and establish appropriate action plans</li> <li>• recognize the need for work with other professionals and networking</li> <li>• know leadership characteristics (listening, stewardship, empathy, foresight, building communities etc.)</li> <li>• discuss the importance of leadership for effective and productive work</li> <li>• describe employee and employer rights and duties as outlined in the employment legislation</li> </ul> <p><b>Practical</b></p> <ul style="list-style-type: none"> <li>• know the basic principles of planning, organizing, motivating and controlling the organization and how to use them</li> <li>• identify and set goals</li> <li>• cope with uncertainty and ambiguity and are not afraid of making mistakes while trying new things</li> </ul>
<b>Learning and teaching methods</b>	<ul style="list-style-type: none"> <li>• Direct instruction</li> <li>• Discussion</li> </ul>
<b>Ratio lecture/practical training</b>	90/10
<b>Assessment methods</b>	<ul style="list-style-type: none"> <li>• Formative assessment (e.g. quiz)</li> </ul>
<b>Literature (suggestions)</b>	<ul style="list-style-type: none"> <li>• Henry, C. (2013), Veterinary Business and Enterprise: Theoretical Foundations And Practical Cases.</li> <li>• Ponsford, E. (2019), Lean Veterinary Practice Management: Higher Quality, Less Waste, Better Resource Utilization and Continuous Improvement.</li> </ul>



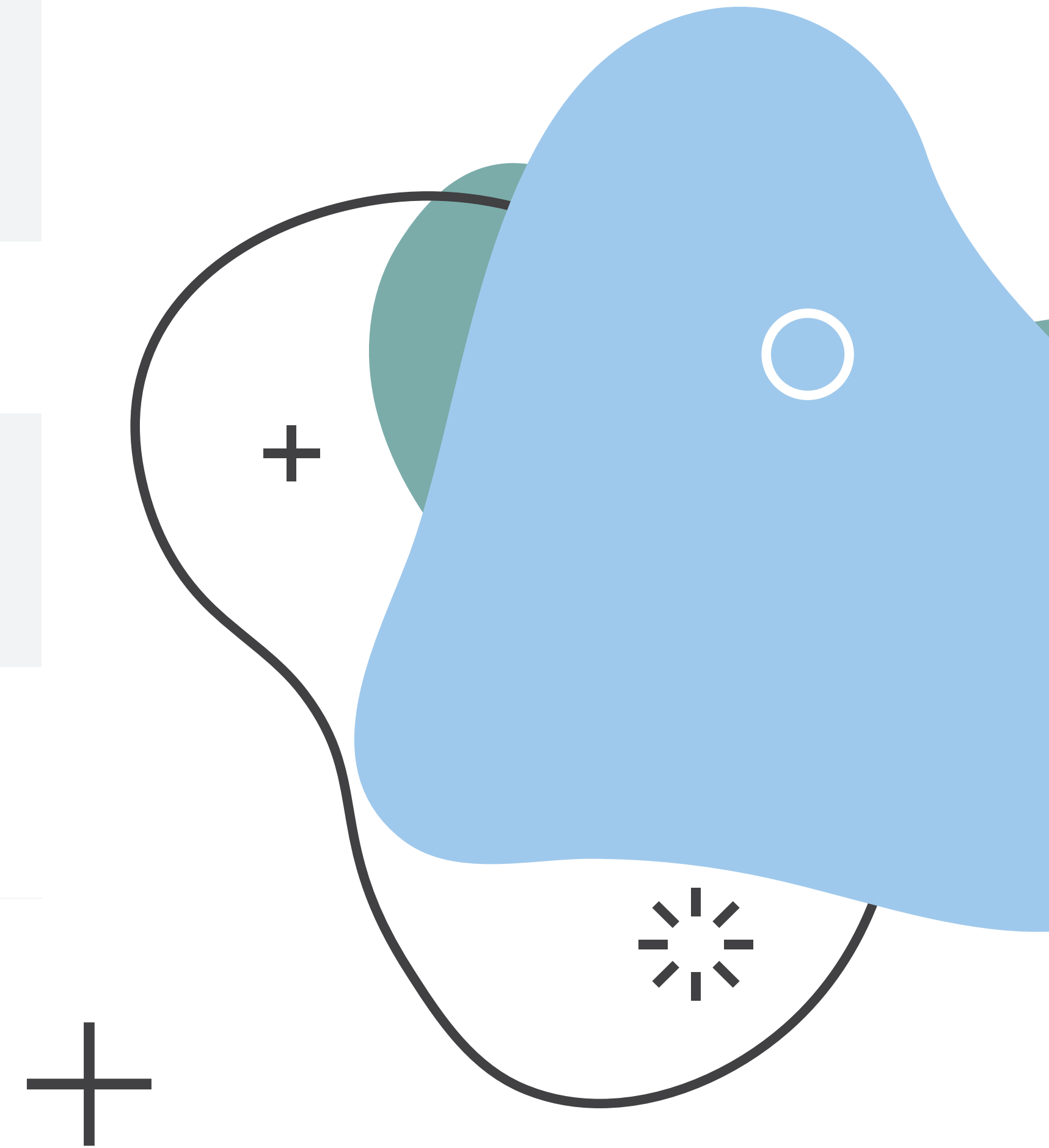
## Topic 5: Entrepreneurial mind-set and innovation

The aim of this module is to develop an understanding of the concepts of entrepreneurship and innovation and providing students with practices and tools that will help improving entrepreneurial skills such as opportunity recognition and innovativeness.

<b>Content</b>	<ul style="list-style-type: none"> <li>• Basics of entrepreneurship</li> <li>• Opportunity recognition</li> <li>• Types of innovation</li> <li>• Sources of innovation</li> <li>• Design thinking</li> <li>• Problem solving</li> <li>• Creativity techniques</li> <li>• Storytelling</li> </ul>
<b>Intended Learning Outcomes</b>	<p><b>Cognitive</b></p> <ul style="list-style-type: none"> <li>• recognise the many forms of value that can be created through entrepreneurship, such as social, cultural or economic value</li> <li>• identify, create and seize opportunities</li> <li>• develop ideas that create value for themselves and others tell the difference between types of innovation (e.g. process vs. product and social innovation, incremental vs. disruptive innovation)</li> <li>• be problem solving oriented</li> <li>• describe the importance of keeping up to date with developments in veterinary science/medicine and changes in markets</li> <li>• identify and describe the role and value of innovation in the profession</li> <li>• improve existing products, services and processes so that they better meet their needs, or those of peers, patients, patient owners, and the society as a whole</li> </ul> <p><b>Practical</b></p> <ul style="list-style-type: none"> <li>• identify personal, social and professional opportunities for creating value, both in existing organisations or by setting up a new business</li> <li>• use tools to identify opportunities, threats and changes in the competitive environment</li> <li>• think and act in an entrepreneurial way</li> <li>• be proactive use the knowledge and understanding of the market and competitive environment to make opportunities to create value</li> <li>• recognise challenges and identify needs in the veterinary environment</li> <li>• make a difference in service offered</li> <li>• adjust his/her activities to changing market, knowledge and environment</li> <li>• pitch effectively in front of peers and stakeholders</li> </ul>



<b>Learning and teaching methods</b>	<ul style="list-style-type: none"> <li>• Direct instruction</li> <li>• Practical training</li> <li>• Collaborative learning</li> <li>• Case studies</li> <li>• Discussion</li> </ul>
<b>Ratio lecture/ practical training</b>	60/40
<b>Assessment methods</b>	<ul style="list-style-type: none"> <li>• Formative assessment (e.g. quiz)</li> <li>• Individual presentations</li> <li>• Group presentations</li> </ul>
<b>Literature (suggestions)</b>	<ul style="list-style-type: none"> <li>• Bessant, J., Tidd, J. (2015), Innovation and Entrepreneurship.</li> <li>• Neck, H.M., Green, P.G., Brush, C.G. (2014), Teaching Entrepreneurship.</li> <li>• Gerber, M.E. (2015), The E-Myth Veterinarian.</li> <li>• Ries, E. (2011), The Lean Startup.</li> </ul>







## Topic 6: Ethics and sustainability

The aim of this module is to develop awareness and understanding of ethical behaviour and sustainability, particularly with regard to One Health and animal welfare, environment, and society.

<b>Content</b>	<ul style="list-style-type: none"> <li>• Ethics in the veterinary profession</li> <li>• UN Sustainable Development Goals</li> <li>• Impact assessment</li> </ul>
<b>Intended Learning Outcomes</b>	<p><b>Cognitive</b></p> <ul style="list-style-type: none"> <li>• recognise behaviours that show integrity, honesty, responsibility, courage and commitment</li> <li>• maintain ethical behaviour towards the profession and to society when exercising their responsibilities</li> </ul> <p><b>Practical</b></p> <ul style="list-style-type: none"> <li>• identify and discuss the impact their actions have on the target group, environment and society</li> <li>• identify the positive and negative effects veterinarians' activities can have for the society and environment</li> </ul>
<b>Learning and teaching methods</b>	<ul style="list-style-type: none"> <li>• Direct instruction</li> <li>• Collaborative learning</li> <li>• Case studies</li> <li>• Discussion</li> </ul>
<b>Ratio lecture/practical training</b>	80/20
<b>Assessment methods</b>	<ul style="list-style-type: none"> <li>• Formative assessment (e.g.)</li> <li>• Presentations</li> </ul>
<b>Literature (suggestions)</b>	<ul style="list-style-type: none"> <li>• Mackenzie, J. S., &amp; Jeggo, M. (2019). The One Health Approach-Why Is It So Important?. <i>Tropical medicine and infectious disease</i>, 4(2), 88.</li> <li>• <a href="https://www.un.org/sustainabledevelopment/">https://www.un.org/sustainabledevelopment/</a></li> <li>• Chang, A.M. (2018), <i>Lean Impact: How to Innovate for Radically Greater Social Good</i>.</li> </ul>





### C. DIGITAL SKILLS FOR VETERINARIANS

Digitalization affects all professions and does not stop at health care professions, so reforms are necessary [23]. Digital literacy and media competence are not only important in scientific work, but are relevant to everyone at work, at home, as citizens and as consumers. The European Commission defined that "digital competence involves the confident and critical use of Information Society Technology (IST) for work, leisure and communication. It is underpinned by basic skills in information and communication technology (ICT): the use of computers to retrieve, assess, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet." [24, p. L394/15-16]. Higher wages and better employability are associated with more frequent use of information and communication technologies in the workplace [25]. Therefore, similar to entrepreneurship, digital skills are relevant for the veterinary profession to remain competitive in the market and provide modern and optimal care services. As far as we know, the use and application of technology in veterinary education has increased significantly [22], [26], [27]. The European Commission has published The Digital Competence Framework for Citizens (DigComp) [28, 29], which are general competences that every citizen should acquire. The European Coordinating Committee of the FVE on Veterinary Training (ECCVT) has also published a position paper "Embracing digital technology in veterinary practice", calling on all stakeholders involved in veterinary

education and training to work together to prepare the veterinary profession for this new digital era. However, there is not yet a comprehensive competency model for digital skills training in undergraduate veterinary education.

#### Goal

The goal of this course is to integrate digital competence training into higher veterinary education.

#### Description of the course:

Training in the acquisition of digital competencies may take the form of a separate course that includes the acquisition of theoretical and practical competencies. Alternatively, digital competences can be acquired in the form of a course that introduces the basic theoretical concepts of digital content; most practical digital skills are acquired by students in various pre-clinical or clinical courses where the theoretically acquired skills are applied in practice. The theoretical and practical skills described should be acquired and practiced throughout the veterinary study programme.

#### The objectives of the course

To provide students of veterinary medicine with knowledge and skills in Information and Communication Technology (ICT) that will enable them to acquire, assess and present information during their studies.

To equip veterinary graduates ("Day 1 graduates") with skills in confident and critical use of ICT that will enable them to use digital tools to retrieve, assess, store, produce, present and share information and to communicate and participate in collaborative networks with scientists, organizations, industries, governments, animal owners and others via the Internet.





## The overview of the course

The following descriptions provide suggestions for 7 topics/modules that can be used to teach the 8 identified digital skills competence areas in the context of the veterinary profession, totaling 4 ECTS for 7 modules. These are flexible and can be individually composed according to the requirements and circumstances of the educational institution and varied according to the form of teaching digital skills (in one course or as part of different courses), number of teaching hours available. The average ratio of theoretical cases / practical training is 43/57% and varies from 60/40 to 30/70%.

### The topics are:

1. Information and data
2. Search for data
3. Digital resources and environments
4. Security
5. Copyright
6. Sharing and collaborating through digital technologies
7. Digital identity

Topic 1: Information and data	
<b>Content</b>	<ul style="list-style-type: none"> <li>• Data and information concepts</li> <li>• Difference between data and information</li> <li>• Information needs</li> <li>• Ways to reach information and data</li> <li>• Information systems</li> </ul>
<b>The ratio of theoretical classes/practical training</b>	60/40
<b>Intended learning outcomes</b>	<p><b>Cognitive:</b></p> <ul style="list-style-type: none"> <li>• Identify and explain information needs and potential sources of information (e.g., scholars, organizations, governments, industries, customers, associations).</li> </ul> <p><b>Practical:</b></p> <ul style="list-style-type: none"> <li>• Name their teacher / colleagues websites, blogs, social networks and digital databases they routinely access on their computer in order to consult literature for their homework.</li> </ul>
<b>Learning and teaching methods</b>	Direct instruction Collaborative learning Discussion Methods: teacher and student centered approach, individual and group work
<b>Assessment methods</b>	Formative assessment (for example: quiz)
<b>Suggested allocation of ECTS per module</b>	0.5





### Topic 2: Search for data

<b>Content</b>	<ul style="list-style-type: none"> <li>• Search engines</li> <li>• Databases, including national and international veterinary databases (e.g. PubMed, ScienceDirect, EFSA Knowledge Junction, ProMED, WAHIS, Eurostat, OMIA).</li> <li>• Organization of the data in the information systems</li> <li>• Different search strategies</li> <li>• Different searching language types (e.g., controlled vocabulary, keywords)</li> <li>• Formatting citations.</li> </ul>
<b>The ratio of theoretical classes/practical training</b>	30/70
<b>Intended learning outcomes</b>	<p><b>Cognitive:</b></p> <ul style="list-style-type: none"> <li>• Identify how information systems are organized in order to access relevant information.</li> <li>• Identify and use different search engines with digital resources.</li> <li>• Distinguish between the different search engines with digital resources.</li> <li>• Create appropriate search strategies for identifying digital resources (websites, blogs and different digital databases).</li> <li>• Refine information need and search strategies based on results.</li> <li>• Apply different searching language types (e.g., controlled vocabulary, keywords).</li> </ul> <p><b>Practical:</b></p> <ul style="list-style-type: none"> <li>• Use and explain to others well-defined keywords to find literature resources in websites, blogs and digital databases, and explain how they access and navigate between the results they find.</li> <li>• Fix problems such as identifying that they have accessed the wrong website, or that they are navigating away from their routinely-used websites.</li> </ul>
<b>Learning and teaching methods</b>	<p>Direct instruction</p> <p>Inquiry based learning</p> <p>Problem based learning</p> <p>Flipped learning</p> <p>Methods: teacher and student centered approach, individual and group work</p>
<b>Assessment methods</b>	Formative assessment (for example: quiz, documentation and presentation of results of inquiry based learning)
<b>Suggested allocation of ECTS per module</b>	0.5





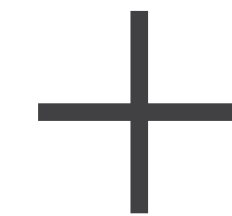
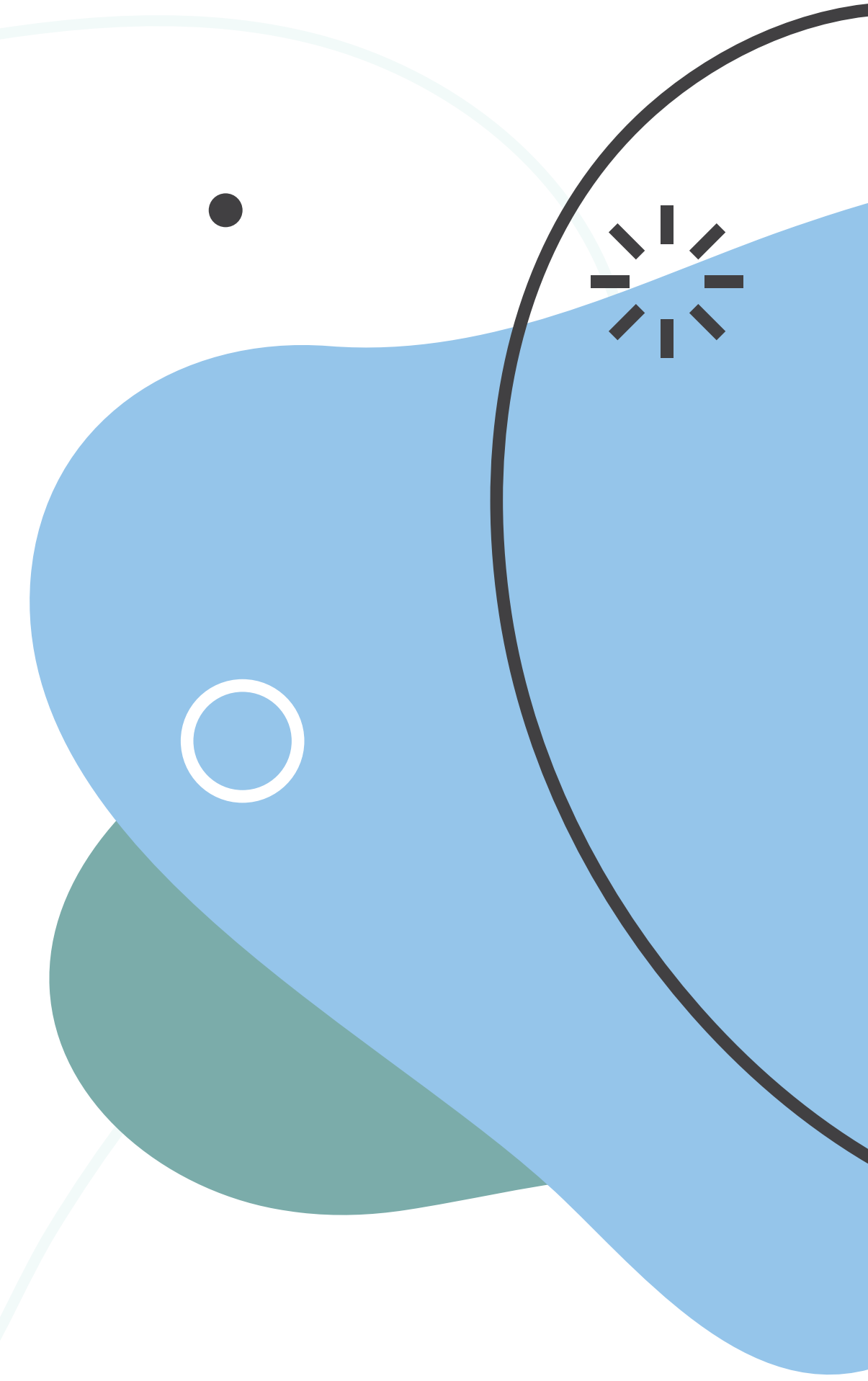
### Topic 3: Digital resources and environments

<b>Content</b>	<ul style="list-style-type: none"> <li>• Definition of digital resources</li> <li>• Criteria for evaluation of credibility, reliability, usability of data</li> <li>• Ways to edit digital resources with different ICT</li> <li>• Ways to create digital resources with different ICT</li> </ul>
<b>The ratio of theoretical classes/practical training</b>	<p>40/60</p>
<b>Intended learning outcomes</b>	<p><b>Cognitive:</b></p> <ul style="list-style-type: none"> <li>• Critically evaluate the credibility and reliability of digital resources</li> <li>• Evaluate the usability of digital resources for achieving the learning objectives and the competence levels</li> <li>• Identify and classify sources of information for validity according to the source.</li> <li>• Perform the analysis, comparison and evaluation of the credibility and reliability of well-defined sources of data, information and digital content.</li> <li>• Select data, information and content in order to organise, store and retrieve in digital environments.</li> <li>• Organise them in a routine way in a structured environment.</li> <li>• Create and manage existing digital resources, where permitted.</li> <li>• Combine and intertwine existing digital resources or their parts, where permitted.</li> </ul> <p><b>Practical:</b></p> <ul style="list-style-type: none"> <li>• (Through the use of a concept map) list reasons why web pages (resources) should be evaluated for their validity and effectiveness.</li> <li>• (Through the use of classroom computers) evaluate and rank a variety of web pages (resources) based on the criteria on a given rubric.</li> <li>• (In a writing sample in their journals) summarize pros and cons of each website resource that is evaluated.</li> <li>• (During an in class presentation using the overhead) work with partners to distinguish between one web site (resource) that is valid and reliable and one site resource containing non reliable sources.</li> <li>• Indicate ways to create and edit well-defined and routine content in well-defined and routine formats.</li> <li>• Explain ways to modify, refine, improve and integrate well-defined items of new content and information to create new and original ones.</li> </ul>



## Topic 3: Digital resources and environments

<b>Learning and teaching methods</b>	Direct instruction Project based learning Problem based learning Collaborative learning Methods: teacher and student centered approach, individual and group work
<b>Assessment methods</b>	Formative assessment (for example: quiz, documentation of the project phases, project results)
<b>Suggested allocation of ECTS per module</b>	0.5







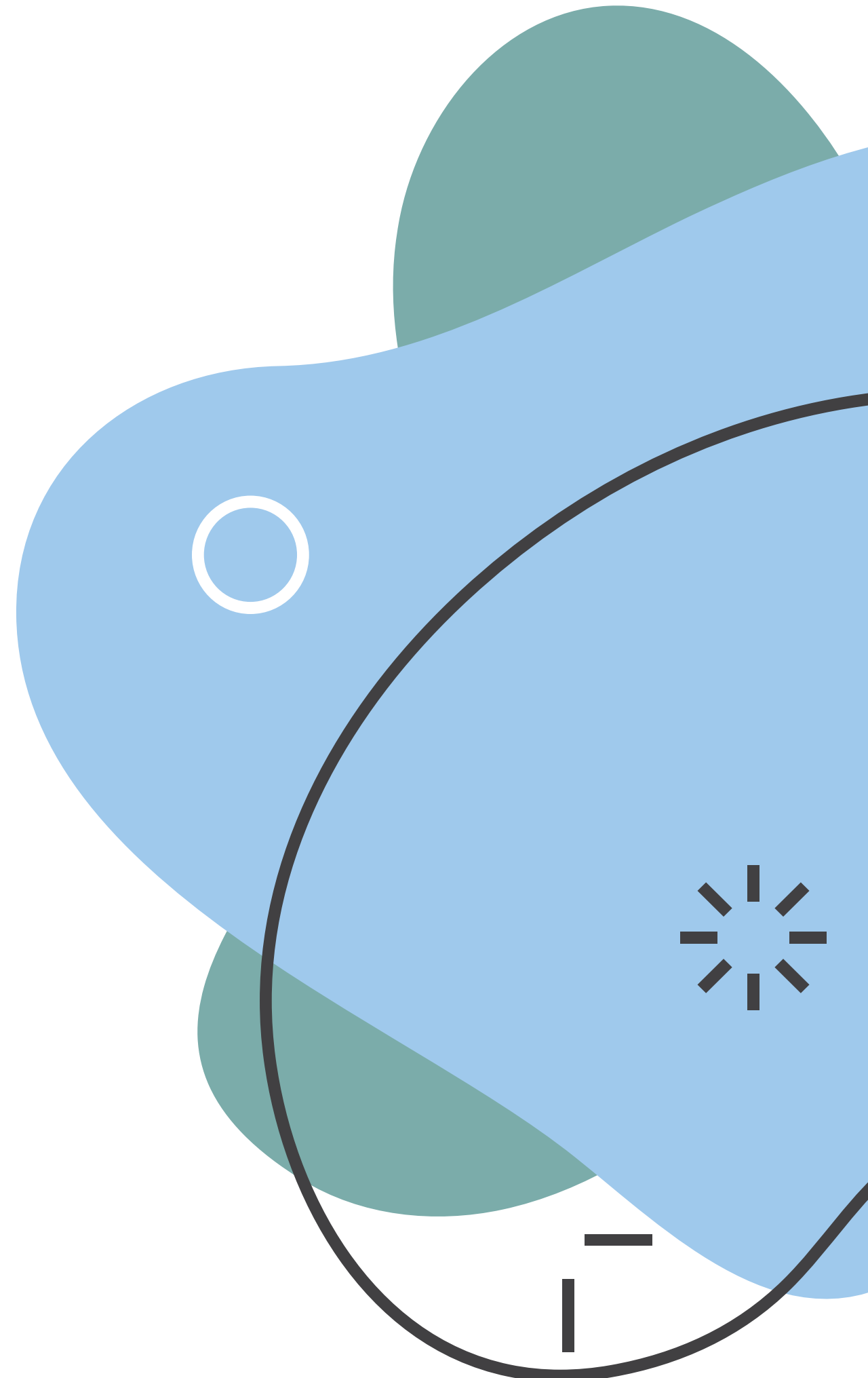
#### Topic 4: Security

<b>Content</b>	<ul style="list-style-type: none"> <li>• Basic knowledge regarding the internet history.</li> <li>• Basic knowledge of how the Internet works.</li> <li>• Definition of the terms: internet, web browser, hacking, cybercrime, malware, identity theft, etc.</li> <li>• Reasons for protecting data on computers and devices.</li> <li>• Methods of social engineering.</li> <li>• Dangers of personal security and file security.</li> <li>• Monitoring the access on data and files.</li> <li>• Encryption and decryption of the files.</li> <li>• Passwords and Biometric security techniques.</li> <li>• Network and different types of network (LAN, WLAN, VON).</li> <li>• Anti-virus software.</li> <li>• Different types of firewalls and their limitations.</li> <li>• Wireless security.</li> <li>• Backups.</li> <li>• Methods of permanently deleting data.</li> <li>• Reducing spams.</li> </ul>
<b>The ratio of theoretical classes/practical training</b>	<p>50/50</p>
<b>Intended learning outcomes</b>	<p><b>Cognitive:</b></p> <ul style="list-style-type: none"> <li>• Understand different security terms (e.g. cybercrime, confidentiality, integrity, malware)</li> <li>• Understand the reasons for protecting workplace information on computers and devices (e.g. preventing theft, fraudulent use, accidental data loss, sabotage etc.)</li> <li>• Understand how anti-virus software works and the importance of regularly updating software</li> <li>• Understand and identify measures for preventing unauthorised access to data</li> <li>• Understand and recognise good password policies</li> <li>• Understand the importance of having a backup procedure and identify its features</li> </ul> <p><b>Practical:</b></p> <ul style="list-style-type: none"> <li>• Recognise malicious, accidental threats to data from individuals, service providers, external organisations (fraudulent e-mail, unsolicited e-mail, ...)</li> <li>• Recognise threats to data from using cloud computing</li> <li>• Recognise types of infectious malware, ways that malware can be concealed on devices and understand how they work</li> <li>• Identify common methods of permanently deleting data</li> </ul>



Topic 4: Security

Learning and teaching methods	Direct instruction Problem based learning Collaborative learning Flipped learning Methods: teacher and student centered approach, individual and group work
Assessment methods	Formative assessment (for example: quiz, documentation of the problem-based learning, solution for problem)
Suggested allocation of ECTS per module	0.5



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### Topic 5: Copyright

<b>Content</b>	<ul style="list-style-type: none"> <li>• Basic history of copyright.</li> <li>• Definition of the general terms: copyright, author,</li> <li>• Purpose of copyright.</li> <li>• Licenses and its characteristics.</li> <li>• Organization Creative Commons and its licensing principles.</li> <li>• Different content's copyright information.</li> <li>• Protecting contents with copyright information.</li> </ul>
<b>The ratio of theoretical classes/practical training</b>	40/60
<b>Intended learning outcomes</b>	<p><b>Cognitive:</b></p> <ul style="list-style-type: none"> <li>• Trace the basic history of copyright.</li> <li>• Explain general copyright terms.</li> <li>• Explain the purpose of the copyright.</li> <li>• Understand key characteristics of licenses.</li> <li>• Understand Creative Commons licensing principles.</li> <li>• Consider copyright while using existing digital resources.</li> <li>• Consider copyright while creating different digital resources.</li> </ul> <p><b>Practical:</b></p> <ul style="list-style-type: none"> <li>• Find different web resources and recognize their copyrights and licenses.</li> <li>• Create new resources and provide appropriate Creative Common license for the new resource.</li> <li>• Properly cite resources that are protected with copyright for distributing or publishing on-line.</li> <li>• Use different online resources with free digital materials.</li> </ul>
<b>Learning and teaching methods</b>	<p>Direct instruction</p> <p>Inquiry based learning</p> <p>Flipped learning</p> <p>Methods: teacher and student centered approach, individual and group work</p>
<b>Assessment methods</b>	Formative assessment (for example: quiz, documentation and results of the inquiry based learning)
<b>Suggested allocation of ECTS per module</b>	0.5






**Topic 6: Sharing and collaborating through digital technologies**

<b>Content</b>	<ul style="list-style-type: none"> <li>• Definition of digital technologies.</li> <li>• Meaning of data sharing.</li> <li>• Advantages and limitations of encryption for data sharing.</li> <li>• Definition of data clouds.</li> <li>• Different technologies for online sharing.</li> <li>• Meaning of collaboration.</li> <li>• Ways of using technologies in support of collaboration.</li> <li>• Different technologies for online collaboration.</li> </ul>
<b>The ratio of theoretical classes/practical training</b>	<p>30/70</p>
<b>Intended learning outcomes</b>	<p><b>Cognitive:</b></p> <ul style="list-style-type: none"> <li>• Recognize appropriate digital technologies to share data, information and digital content.</li> <li>• Understand how to act as an intermediary for sharing.</li> <li>• Understand working with data clouds.</li> <li>• Understand the advantages and limitations of encryption for data sharing. Be aware of the importance of not disclosing or losing the encryption password, key, certificate.</li> <li>• Select well-defined and routine digital tools and technologies for collaborative processes.</li> <li>• Use digital technologies for collaborative learning/work.</li> <li>• Promote the use of digital technologies to present cooperative forms of learning/work.</li> <li>• Use digital technologies for peer evaluation.</li> <li>• Engage individually and collectively in some cognitive processing to understand and resolve well-defined and routine conceptual problems and problem situations in digital environments.</li> </ul> <p><b>Practical:</b></p> <ul style="list-style-type: none"> <li>• Using appropriate digital technologies at advanced level to share data, information and digital content (e.g., information transfer with clients and stakeholders).</li> <li>• Explain how to act as an intermediary for sharing Encrypt a file, folder, drive before sharing.</li> <li>• Set a password for files such as documents, spreadsheets, compressed files.</li> <li>• Use different digital tools and technologies to ask for well-defined information on the course/topic/problem they are following/working on, and use their tools (e.g., blog, wiki, social media) to create a new entry for exchanging more information.</li> <li>• Engage in exercises that use digital tools and technologies (e.g., simulations, biological data analysis, veterinary diagnostic images, bioinformatics data analysis, clinical reasoning and decision using validated tools) to practice a veterinary problem.</li> </ul>

## Topic 6: Sharing and collaborating through digital technologies

<b>Learning and teaching methods</b>	Direct instruction Collaborative learning Problem based learning Methods: teacher and student centered approach, individual and group work
<b>Assessment methods</b>	Formative assessment (for example: quiz, participation in forum, etc.)
<b>Suggested allocation of ECTS per module</b>	1





### Topic 7: Digital identity

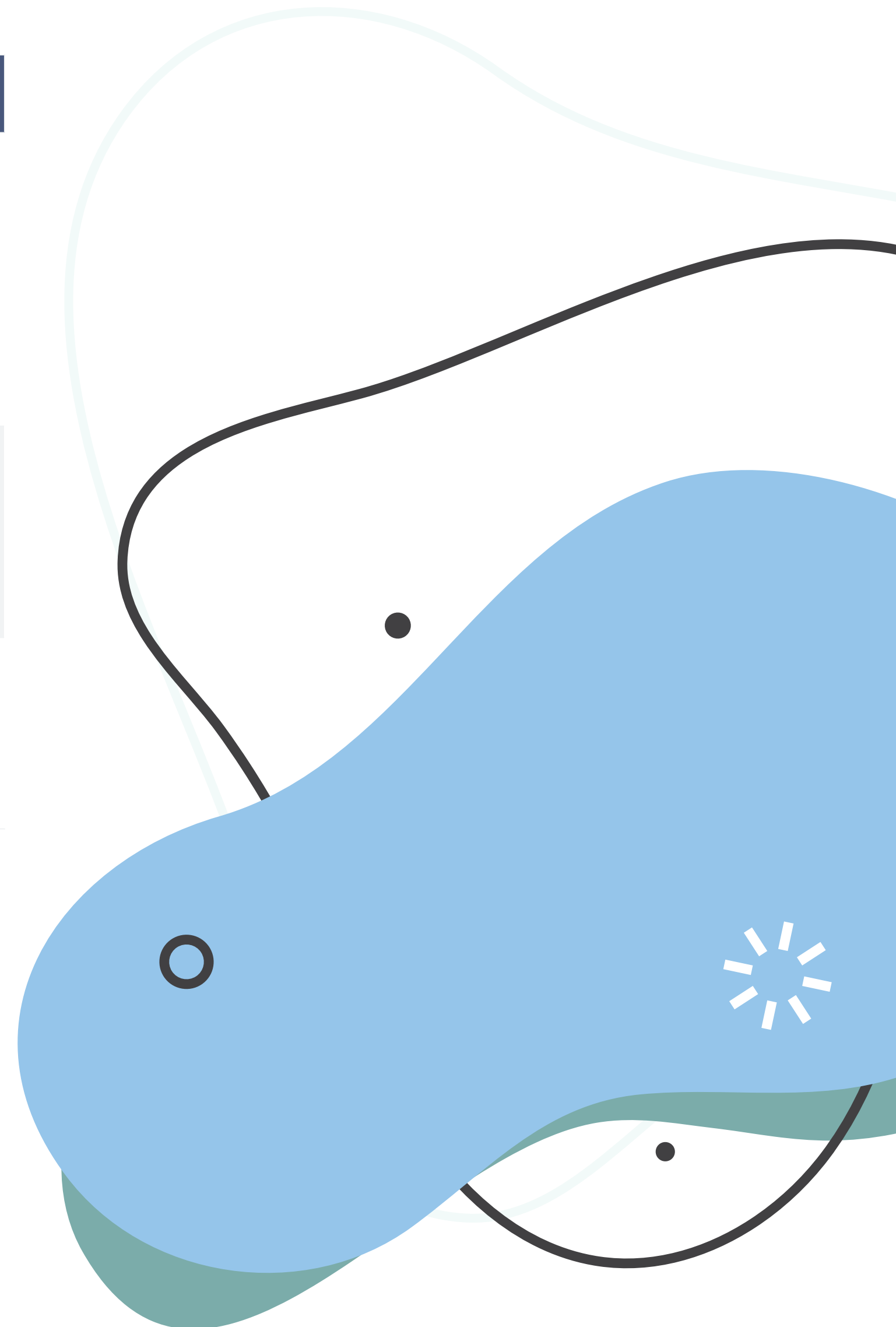
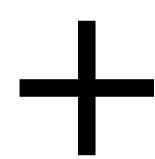
<b>Content</b>	<ul style="list-style-type: none"> <li>• Reasons for protecting personal information (avoiding identity theft, fraud, maintaining privacy).</li> <li>• Identity theft and its implications.</li> <li>• Methods of identity theft.</li> <li>• Digital signature.</li> <li>• Ways to protect personal data and privacy in different digital environments.</li> <li>• Ways to use and share personally identifiable information.</li> <li>• Privacy policy statements on how personal data is used in digital services.</li> </ul>
<b>The ratio of theoretical classes/practical training</b>	<p>50/50</p>
<b>Intended learning outcomes</b>	<p><b>Cognitive:</b></p> <ul style="list-style-type: none"> <li>• Understand the reasons for protecting personal information such as: avoiding identity theft, fraud, maintaining privacy.</li> <li>• Understand the term identity theft and its implications: personal, financial, business, legal.</li> <li>• Identify methods of identity theft such as: information diving, skimming, pretexting.</li> <li>• Understand the term digital signature.</li> <li>• Learn about well-defined and routine ways to protect their personal data and privacy in digital environments.</li> <li>• Learn about well-defined and routine ways to use and share personally identifiable information while protecting themselves and others from damages.</li> <li>• Learn about well-defined and routine privacy policy statements of how personal data is used in digital services.</li> </ul> <p><b>Practical:</b></p> <ul style="list-style-type: none"> <li>• Select the most appropriate way to protect their personal data (e.g. address, phone number), before sharing it on the school's / workplace's digital platform.</li> <li>• Distinguish between appropriate and inappropriate digital content to share it on their school's / workplace's digital platform, so that their privacy and that of their classmates are not damaged.</li> <li>• Assess whether the way their personal data are used on the digital platform is appropriate and acceptable as regards their rights and privacy.</li> <li>• Overcome complex situations that can arise with their personal data while on the digital platform, such as personal data is not used in accordance to the "Privacy policy" of the platform.</li> </ul>





## Topic 7: Digital identity

<b>Learning and teaching methods</b>	Direct instruction Problem based learning Flipped learning Methods: teacher and student centered approach, individual and group work
<b>Assessment methods</b>	Formative assessment (for example: quiz, documentation and results of the problem based learning)
<b>Suggested allocation of ECTS per module</b>	0.5





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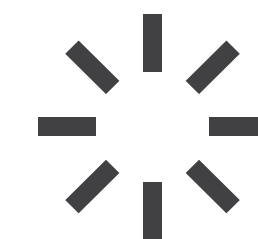
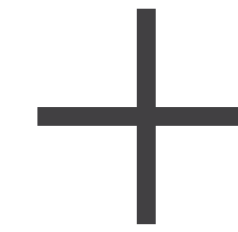
Carretero S, Vuorikari R, Punie Y. DigComp 2.1: The Digital Competence Framework for Citizens with eight proficiency levels and examples of use. Joint Research Centre (Seville site), 2017. doi:10.2760/38842

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## Recommendations for stakeholders

1. EAEVE should actively encourage their current and aspiring members to implement suggested competences and learning outcomes in their curricula
2. Learning outcomes and competences integrated in the respective curricula should be evaluated through the EAEVE/ESEVT accreditation system of veterinary schools
3. European veterinary schools should advocate adequate time, staff and practical provisions for teaching of life skills at their respective schools
4. European veterinary schools should offer and actively encourage additional education of their staff in the field of life skills



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## Recommended resources & further reading

**EACH** (International Association for Communication in Healthcare)  
<https://www.each.eu/resources/>

International Association for Communication in Healthcare is a global organisation dedicated to exploring and improving the ways in which healthcare professionals, patients and relatives communicate with one another.

**EACH** and its members work together to:

- Promote effective, patient-centred and evidence-based healthcare communication
- Provide expertise, resources and skills for health communication education, research and practice
- Encourage networking between healthcare communication professionals to provide advice and cooperation on health communication projects and education

**MedEdWorld** (Global medical education community)  
<http://www.mededworld.org>

**MedEdWorld** is an international health professions community of individuals and educational organisations whose purpose is the sharing of information, ideas, experience and expertise.

**VIEW** (Veterinary Education Worldwide)  
<https://vetedworldwide.com/>

**VIEW** represents a community of individual scholars committed to excellence in veterinary education worldwide. ViEW is a not-for-profit organisation which brings together colleagues involved in veterinary education, and shares ideas and experiences with those from allied disciplines such as medicine, dentistry, and nursing.

**NOVICE** (Network of Veterinarians in Continuing Education)  
<https://www.clinicalskillsandsimulation.com/>

**NOVICE** is a network of Information and Communication Technologies (ICT) educationalists working within veterinary schools and collaborating with veterinarians and students. It aims to explore and extend the use of online Web 2.0 tools in veterinary education and lifelong learning.



## **INVEST** (International Veterinary Education in Simulator Training)

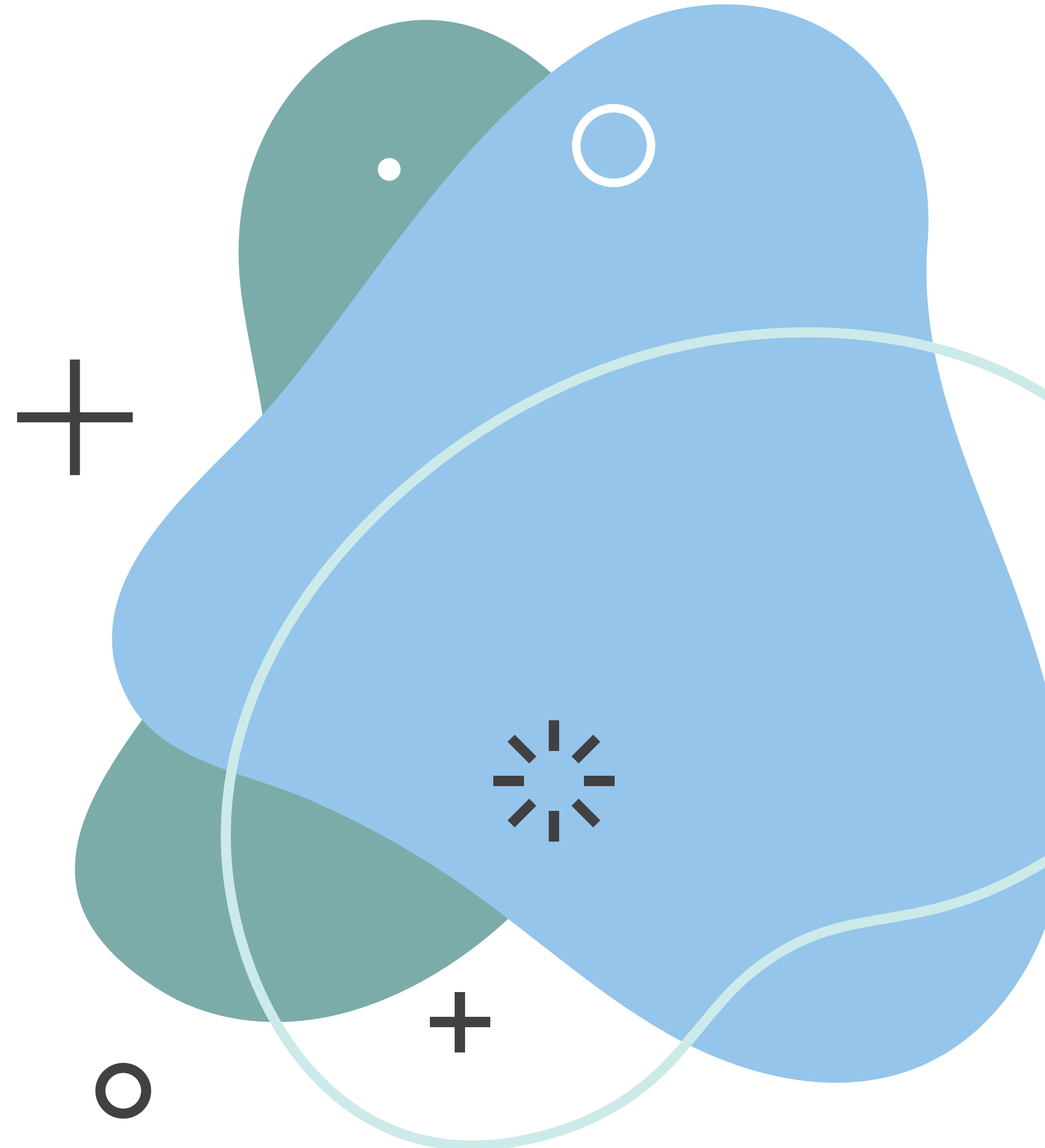
<http://www.vetedsimulation.com>

**InVeST** is an informal group that was started in August of 2011 following a very successful Veterinary Simulation Exchange symposium hosted by the College of Veterinary Medicine and Biomedical Sciences at Colorado State University in Fort Collins, Colorado.

## **Digital Skills Toolkit**

This toolkit provides policymakers and other stakeholders with practical information, examples, and step-by-step guidance to develop a national digital skills strategy. Topics in the toolkit include: engaging the right stakeholders, inventorying and assessing existing policies, developing strategies for varied proficiency levels, creating strategies for under-represented groups such as women and persons with disabilities, organising campaigns and joining regional or international initiatives, and monitoring and updating the strategy.

<https://www.itu.int/en/ITU-D/Digital-Inclusion/Youth-and-Children/Pages/Digital-Skills-Toolkit.aspx>.





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[https://ec.europa.eu/programmes/erasmus-plus/projects\\_en](https://ec.europa.eu/programmes/erasmus-plus/projects_en)  
 and on the project webpage: [www.softvets.eu](http://www.softvets.eu)

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