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RAMON LLULL UNIVERSITY

Data and Business Ethics (DBE)

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DBAI, Year 4, 2025-2026

6 ECTS

Barcelona, September 2025

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1. Course description

This course invites students to explore how data and AI systems shape, and are shaped by, legal norms, ethical principles, and institutional contexts. It combines perspectives from computer science, law, and the social sciences to examine how technical choices (e.g., model design, data selection, performance metrics) can lead to real-world consequences in terms of fairness, accountability, and power dynamics. Throughout the course, students will analyze concrete cases, compare regulatory approaches, and engage in debates that require them to think across disciplines. The course is designed for students with a solid technical background who are ready to reflect critically on the broader impact of the systems they help build.

This course builds on the knowledge and skills developed in earlier stages of the program. While there are no formal prerequisites, students are expected to have successfully completed and assimilated key learnings from the following courses: *Introduction to AI, Machine Learning, Sociology, Business Law*, and *Organization Theory*.

Data and Business Ethics consolidates a core objective of the BBAI program: enabling students to understand and address the institutional, legal, and social implications of AI technologies in business settings. It builds directly on prior technical courses, such as *Introduction to AI, Machine Learning*, and *Cloud Solutions*, by examining how technical decisions are embedded in broader organizational and regulatory contexts. As part of the **Business Strategy** module, the course encourages students to consider how AI systems interact with legal frameworks, corporate governance, and public accountability. This training is essential for students who will go on to work in roles that require navigating both technical complexity and external constraints, such as AI product managers, technology consultants, compliance analysts, or professionals involved in the implementation of regulatory requirements (e.g., the EU AI Act or data protection law). The course strengthens students' capacity to collaborate across technical and non-technical teams and to anticipate the legal and reputational risks involved in deploying algorithmic systems in business environments.

Students are expected to have a solid technical foundation, including the ability to train, evaluate, and fine-tune both supervised and unsupervised learning models. They should understand performance metrics such as accuracy, precision, recall, and AUC, and be familiar with key concepts like overfitting, regularization, and model validation techniques, including cross-validation. Practical experience with Python and relevant libraries (e.g., scikit-learn, pandas, numpy) is also required, as well as familiarity with the full lifecycle of AI system design and deployment in applied contexts. In addition, students should be familiar with foundational legal and sociological concepts relevant to AI governance. They are expected to engage critically with texts from law and sociology, including discussions on power asymmetries, fairness, accountability, and the institutional context in which data-driven systems are developed and deployed.

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2. Learning objectives and competencies

By the end of the course, students will be able to:

- **Analyze the social and ethical implications of AI.** Students will learn to examine the broader impact of AI systems on individuals, organizations, and society. They will evaluate competing values, and reason through tensions that emerge in specific business contexts.
- **Evaluate the effects of technical design choices**. Students will explore how choices in data selection, model architecture, evaluation metrics, and deployment environments influence key normative outcomes of AI systems. They will learn to identify where and how ethical concerns manifest throughout the lifecycle of AI systems.
- **Compare global governance approaches to AI.** Students will explore major AI governance approaches, with emphasis on the EU AI Act and comparison to global initiatives. They will assess the objectives, enforcement mechanisms, and institutional assumptions embedded in different regulatory models.
- **Design responsible AI governance strategies**. Students will develop practical recommendations to guide the design, implementation, and oversight of AI systems in business. They will learn to define internal governance structures, anticipate external accountability demands, and translate ethical principles into operational terms.

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3. Course format and methodological approach

This course is taught in a face-to-face format over 12 weeks, consisting of **20 sessions**. We will meet twice a week for regular **on-campus sessions**, plus another two times for the mid-term and final exams.

The multidisciplinary nature of the course will be reflected in every session and assessment. Students will be asked to combine technical reasoning with ethical and legal argumentation and to justify their analyses from different disciplinary standpoints. They are expected to come prepared to each session, actively engage in discussions, and remain open to contrasting viewpoints.

A significant portion of the work will take place before class. You are expected to review the **Lesson Plan (LP)** for each session, which will be available a few days in advance on the course's eCampus site. Each LP will outline the pre-class work (readings, exercises, or reflections).

> The course is managed through a **dedicated eCampus website**, where you will find all necessary materials, including LPs, readings, pre-class tasks, slides and further references. You will be expected to familiarize yourself with this environment before the course begins and check it regularly for updates.

What we expect from you in class

Attendance

We expect that you **assist classes regularly**. Attendance will be monitored for every session and recorded in the course eCampus website. You **are allowed to miss up to 20% of the course (equivalent to 4 full sessions) without justification**. You need not contact your instructors, nor provide justification for your absences within that limit.

If, by the end of the course, your absences exceed the allowed number of sessions, you may contact program management and provide the necessary documentation to justify your absence. Deadlines for submitting justifications are announced by program management, typically a few weeks before the final exam. **Under no circumstances will instructors of this course accept justifying documentation or excuse student absences**.

You are advised to regularly check your attendance records to ensure accuracy and identify any discrepancies. **Should you detect any error in the attendance register, you must communicate them within one week after the related session.**

> Following ESADE regulations, **attendance is mandatory** for this course. Students who fail to **attend 80% of the course** will not be allowed to pass, will receive a NP for the first sitting of the course and will be required to sit the retake exam. Additionally, to sit the retake, students must have attended at least 50% (10 full sessions) of the course.

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Punctuality and tardiness

We expect that you **arrive on time**. A 5-minute courtesy will be extended for every session. Students arriving later than that will still be allowed in but will be marked as **late**.

> Students arriving late will be expected not to disturb or interrupt the class while coming in and to do so quietly.

Unless previously authorized, leaving class early will also count as a late arrival. **Late arrivals or early departures will count as 75% of full attendance for that session**.

> Final attendance records will reflect both absences and tardiness. For example, a student with 4 absences and 1 late arrival will fall below the minimum attendance requirement. Conversely, a student with 3 absences and 4 late arrivals will meet the attendance requirement and may sit the final exam.

Students who miss 20 minutes or more of a session will be marked as **absent.**

Preparation

We expect that you **come to class prepared**, having checked the study guide, completed the readings and engaged with the pre-class work (if any).

> Submitting pre-class work **is optional yet highly encouraged and will count towards your Active contribution to learning grade**. The pre-class work submission inbox will be open until the day before class at 23:55. No extensions will be allowed.

We expect that you **share your doubts and questions openly** and without reservations. We will do our best to create a welcoming, safe class environment, where you feel seen and heard.

> Office hours will be available every week on demand. Doubts and questions will preferably be answered during those times, with emails being reserved to urgencies and eventualities.

Class behaviour

We expect that you **observe good behavior while in class**. You should not disturb the sessions or address your classmates or instructor impolitely.

We expect that **you are respectful toward your classmates'** doubts and questions and understand that there might be a diversity in the learning process, in the time needed to grasp certain concepts, or in the way others express themselves. We expect you to embrace this diversity.

> We will be your instructors, but your classmates will be your partners in this journey. Their comments, reflections and doubts will also contribute to your own learning. Give them their due respect.

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We also expect that you stay focused throughout the duration of the class. Students who fail to behave appropriately will receive a warning before any penalty or removal. However, students asked to leave class will automatically receive an E for *Active contribution to dialogue*. Repeated inappropriate behavior (after a warning) may escalate to formal disciplinary referral under the DBAI program regulations.

The use of mobile phones is only allowed at the beginning of the class for attendance control purposes. Once the session starts, students will be required to **put their phones aside**. Failing to do so will strongly penalize their contribution score.

You may use your laptops/tablets on the lectures/discussion sessions **only for academic use;** emailing, instagramming, whatsapping, tweeting, chatting, skyping, internet surfing, etc. should not be done during classes. Doing these would strongly penalize your contribution grade.

What we expect from you outside class

We expect that **you revisit the class materials often** to make sure you clarify your doubts before moving on to new concepts.

We expect that you **seek assistance when needed**, whether by approaching us or your classmates. Use office hours or the class chatbot assistant for this purpose. Communication outside class should primarily go through the chatbot, which will handle all questions about policies, deadlines, materials, and procedures.

We expect that you **avoid sending unnecessary emails**, especially during weekends, holidays, or late-night/early-morning hours, unless strictly necessary. Understand that it is your responsibility to stay informed about the course progress. Emails with questions already answered in class or available in the syllabus or eCampus will not be responded.

4. Course Contents

This course is structured in **two parts**.

1. Foundations and perspectives

During the first half of the course, students will be introduced to the core concepts and analytical tools needed to examine data and AI systems from three complementary perspectives:

- **Social and ethical**: how AI functions as a socio-technical phenomenon, the ethical principles commonly invoked in its development and deployment, and the societal consequences of algorithmic systems.
- **Legal and regulatory:** the role of fundamental rights and obligations in shaping technology use, ongoing regulatory initiatives such as the EU AI Act, and comparative approaches across jurisdictions.
- **Technical:** the design and evaluation of AI systems, the lifecycle of development in business contexts, and the ways technical choices affect both ethical concerns and legal compliance.

Together, these perspectives will provide the vocabulary and conceptual grounding to analyze how AI systems operate and how they are governed.

2. Principles in practice

The second half of the course builds on this foundation by applying these perspectives to key principles of data and business ethics. Each session will focus on one principle, encouraging students to integrate social, legal, and technical reasoning. Principles covered will include human agency and oversight, technical robustness and safety, privacy and data governance, transparency, diversity, non-discrimination, and fairness, societal and environmental well-being, and accountability.

Through case-based discussions and practical exercises, students will be asked to confront trade-offs, assess real-world applications, and reflect on the tensions that emerge when principles are put into practice in business environments.

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5. Assessment

Students' performance throughout the course will be evaluated in terms of the following criteria:

- **15% Active contribution to dialogue** (*To pass the course students will be required to obtain at least a 4 in this grading criteria*).

  Students will be required to show maturity and active engagement in the pedagogical activities of the course. Active contribution to dialogue reflects how you engage in the course and help build a productive learning environment for everyone. You are expected to participate in discussions by asking and answering questions, share thoughtful reflections, show preparation, listen respectfully, support an inclusive and focused class atmosphere, and communicate clearly and constructively.

  * See Annex 1 for detailed expectations and evaluation guidelines.

  Scores for Active contribution to dialogue will be given in a A, B, C, D, E scale. The overall outcome average will then be converted to a numerical grade, according to the ESADE scale (see below).

  Warnings: A warning will always be issued before any penalty or removal. However, students are expected to know and follow class behavior rules.

  Penalties: Students who receive warnings for misuse of phones/laptops should expect a reduced grade. Students asked to leave class due to behavior will automatically receive an E for this criterion.

- **10% Learnings reviews.**

  Students will complete graded in-class activities throughout the first half of the semester. These will take place during on-campus sessions. Reviews may include quizzes, polls, exercises, or short tasks designed to test students' completion of pre-class work and understanding of previous session content.

  * See Annex 2 for further guidelines and examples.

  Scores for Learning reviews will be given in a A, B, C, D, E scale. The overall outcome average will then be converted to a numerical grade, according to the ESADE scale (see below) and the lowest grade will be dropped.

  Absences: Students absent on days with graded activities will receive a 0 for that task. In cases where their absence is justified by program management at the end of the course, the corresponding grade will be dropped from the final average.

- **15% Group assignment.**

  Students will complete a group assignment during the second half of the semester where they will be required to integrate and apply key principles related to data and business ethics. This assignment will be designed to reinforce and extend course concepts through applied work, as well as to prepare students for the final exam. The assignment will include both a written component, in the form of a report, and an oral presentation. You will be expected not only to implement solutions but also

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to **justify your choices**, explain trade-offs, compare alternatives, or reflect on the reasoning behind your approach.

* Each group will consist of 5-6 students, who will be expected to work together towards a solution for the suggested case.

Group assignments will be evaluated based on a marking rubric that will be published together with the assignment instructions. Scores for each grading dimension will be given in a A, B, C, D, E scale. The overall outcome average will then be converted to a numerical grade, according to the ESADE scale (see below).

Plagiarism: Students will be expected to submit original work done by themselves, by properly citing external references, when required. At any point throughout the process, you may be required to provide proof, either written or oral, of the originality of your answers and of your authorship.

Recognition of individual work: Although the submission is collective, you will be asked to report individual contributions. In cases of uneven participation, grades may differ across group members.

- **20% Mid-term.**

  Students will sit for a mid-term exam that will evaluate their knowledge and understanding of the theoretical topics covered in the first half of the course.

  Scores for the mid-term exam will be given in a 10-grade scale.

- **40% Final exam** *(To pass the course students will be required to obtain at least a 4 in this grading criteria.)*.

  Students will be required to sit a final exam, where they will demonstrate their understanding of the topics covered throughout the course. Students unable to attend the final for justified, accepted reasons must follow the postponement procedures outlined in the DBAI program regulations.

  Scores for the final exam will be given in a 10-grade scale.

Pre-class work is not mandatory, but it is strongly encouraged. Students who submit relevant pre-class work may receive positive grade adjustments, at the instructor's discretion. Students who do not submit pre-class work will not be penalized.

A learning journal will serve as a reference to evaluate your progress throughout the course, both from a learning and from a mindset perspective. Your reflections in this journal will serve to adjust your grade at the end of the course, if warranted.

This course rewards performance, not effort. You are encouraged to dedicate time and energy to your work, but grades will be based on the quality of your output, not the number of hours invested. Focus on producing work that demonstrates clear understanding, thoughtful reasoning, and accuracy.

The table below includes the **translation** of the A–E scale into numerical terms:

Letter Grade	Numerical Value (ESADE 0–10 scale)
A	10
B	7.5

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Letter Grade	Numerical Value (ESADE 0–10 scale)
C	5
D	2.5
E	0

To pass the course, **students must score at least a 5/10 in the weighted average of all grading components,** and at least a 4/10 on both the *Active contribution to dialogue* and *Final exam* components.

Students who fail to pass the course in their first sitting will be required to sit a retake exam. The retake exam will account for 60% of the final course grade. The remaining 40% will reflect the weighted average of the student's *Active contribution to dialogue* and *Assignments and deliverables* grades. Students will be required to score at least a 4/10 in the retake exam to pass the course in their second sitting. In third or subsequent sittings, the retake exam will account for 100% of the final course grade.

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6. Materials

Readings for each session will be published in the course website. Students will find a detailed study guide in eCampus before the start of each session. They will be given relevant material to prepare themselves for class and be pointed to extra, more advanced readings in case they want to dive further into the subject matter.

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7. Faculty leading the course

Liliana Arroyo is Assistant Professor of the Department of Society, Politics and Sustainability at ESADE Business School. She holds a PhD in Sociology at the University of Barcelona, a Degree in Sociology from the Autonomous University of Barcelona (with a Major in Culture and Education), and a Diploma of the Vicens Vives Programme – Leadership, Values and Commitment at ESADE. She has been linked to ESADE on a Collaborate Professor basis since 2016. She teaches courses on Sociology, Business ethics and the Societal Impacts of Digital Innovation. Her research interest focuses in the area of digital social innovation and meaningful disruption.

Before joining ESADE on a full-time basis, she has been a member of several advisory boards in cultural and third sector organisations and has a decade of experience as an independent consultant. She was Director General for Digital Society at the Catalan Government in the period 2022-2024.

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Josu Eguiluz Castañeira is Legal Counsel at Adevinta, where he advises on AI projects and contractual matters, and he led the legal work of the first European high-risk AI sandbox in employment (InfoJobs). He lectures on Digital Law at ESADE and other leading universities, teaching courses on AI regulation, data protection and technology law. He is also an Industrial PhD Candidate at Universitat Pompeu Fabra, the Barcelona Supercomputing Center and Adevinta, researching the intersection of fundamental rights and high-risk AI systems, with a particular focus on non-discrimination and the AI Act. Previously, he practiced at Cuatrecasas in the New Technologies, Privacy and IP department, one of Europe's top-tier law firms. He graduated in Law with a specialization in LegalTech from Deusto University and completed a Double Master's degree in Legal Practice and Digital Law, Privacy and Intellectual Property at ESADE. He also holds the CIPP/E certification by the IAPP.

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Irene Unceta is Assistant Professor of the Department of Operations, Innovation and Data Sciences at ESADE Business School. She holds an Industrial Ph.D. in Mathematics and Computer Science from the University of Barcelona (UB) and a MSc in Computational Science from the University of Amsterdam (UvA). She has been linked to ESADE on a Collaborate Professor basis since 2018. Before joining ESADE on a full-time basis, she worked as a Data Scientist at BBVA Data & Analytics as part of the Risk Analytics department first and the Cross Analytics program later. She has spent part of her career working on data consulting for different companies and sectors of activity, including telecommunications, banking, and the insurance industry. She is also a partner at Decidata. Irene's research interests are sustainable machine learning and AI ethics. Since March 2023 she is the Academic Director of the Bachelor in Artificial Intelligence for Business (BAIB).

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8. Timetable and sections

This course meets twice a week on Tuesdays and Thursdays from September 9th until November 25th. You can find the complete calendar for the 2025-2026 edition of the course:

	Session	Date	Time	Mode
September	1	Tuesday 09/09	14:45 – 17:15	On-campus
	2	Tuesday 16/09	14:45 – 17:15	On-campus
	3	Thursday 18/09	14:45 – 17:15	On-campus
	4	Tuesday 23/09	14:45 – 17:15	On-campus
	5	Thursday 25/09	14:45 – 17:15	On-campus
	6	Tuesday 30/09	14:45 – 17:15	On-campus
October	7	Thursday 02/10	14:45 – 17:15	On-campus
	8	Tuesday 07/10	14:45 – 17:15	On-campus
	9	Thursday 09/10	14:45 – 17:15	On-campus
		Wednesday 15/10	12:00 – 14:30	Mid-term exam
	10	Tuesday 21/10	14:45 – 17:15	On-campus
	11	Thursday 23/10	14:45 – 17:15	On-campus
	12	Tuesday 28/10	14:45 – 17:15	On-campus
	13	Thursday 30/10	14:45 – 17:15	On-campus
November	14	Tuesday 04/11	14:45 – 17:15	On-campus
	15	Thursday 06/11	14:45 – 17:15	On-campus
	16	Tuesday 11/11	14:45 – 17:15	On-campus
	17	Thursday 13/11	14:45 – 17:15	On-campus
	18	Tuesday 18/11	14:45 – 17:15	On-campus
	19	Thursday 20/11	14:45 – 17:15	On-campus
	20	Tuesday 25/11	14:45 – 17:15	On-campus
December		Tuesday 16/12	14:00 – 16:30	Final exam

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"I will not lie, cheat or steal to gain an academic advantage. I will respect all ESADE students, faculty and staff with my words and deeds."

The violations of the ESADE Honor Code include the following:

Lying: Lying includes knowingly communicating an untruth to gain an unfair academic or employment advantage.

Cheating: Cheating includes, but is not limited to, using unauthorized materials to complete an assignment; copying the work of another person; unauthorized providing of materials or information (e.g. proprietary course information) to another person; plagiarism; unauthorized providing of materials or information to another person during an exam. All communications, written, oral or otherwise, among students during examinations, are forbidden, as is the use of notes, books, computers, calculators or other written material except when approved by the instructor.

Stealing: Stealing includes, but is not limited to, taking the property of another member of the ESADE community without permission, defacing or vandalizing the property of the ESADE Business School, or the misuse of ESADE resources.

Respect for others and professional conduct: Respect for others includes treating all ESADE students, staff, faculty and external contacts connected to the school with politeness and cordiality, refraining from using abusive language or physical violence.

Upon witnessing a violation of the Honour Code, a student has a **moral obligation** to inform the student whose conduct is believed to be in violation of the Code that the Code has been violated. Each member of the ESADE community, as a person of integrity, has a personal obligation to adhere to this requirement, both on campus and when representing ESADE off campus.

Failure to comply with the more explicit guidelines set forth by the Programme's Rules and Regulations can also be considered as beach of the Honour Code.

Violations of this agreement and will be governed by Program Management which has the right to exercise any disciplinary action necessary to uphold the standards set forth herewith and in the Program's Rules and Regulations.

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Annex 1: Guide to Active contribution to dialogue

In this course, you will be evaluated on the **quality of your engagement**, not just your presence. *Active contribution to dialogue* reflects your willingness to participate, listen, reflect, and help create a constructive, inclusive learning environment. It accounts for **15% of your final grade**.

This guide explains how your participation will be evaluated and what is expected from you throughout the course.

What counts as Active contribution?

During **on-campus sessions** you're expected to:

- Ask questions or share relevant reflections
- Offer answers to classmates' or instructor's questions
- Engage thoughtfully in discussions, polls, or group activities
- Support a constructive, inclusive, and respectful atmosphere
- Arrive prepared and focused

*This component is entirely independent of attendance, which is mandatory. Merely showing up to class, whether on-campus or online, is not considered a contribution.

How will you be scored?

Your *Active contribution to dialogue* grade will be based on an **A–E scale***:

Grade	Description
A	Consistent, thoughtful participation; shows strong preparation and respect for others.
B	Regular contributions and solid engagement with some minor gaps.
C	Occasional participation; generally respectful but inconsistently prepared.
D	Rare participation; limited effort or presence in class discussions.
E	No meaningful contribution, frequent disengagement, or disruptive behavior.

You will receive **two Active contribution to dialogue grades** during the course:

- **Mid-course grade**: Shared before the mid-term exam period. This is formative and meant to let you know where you stand, so you can reflect and make adjustments if needed.
- **End-of-course grade**: Shared before the final exam period. This is meant to evaluate your contribution during the second half of the course.

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Your final grade for this component will be the **average of these two scores**.

Communication and Support

We encourage open, respectful communication about your experience with participation.

If you're unsure how to contribute, feel anxious about speaking in class, or would benefit from alternative ways to engage, please reach out, ideally at the **beginning of the course**. We can explore accommodations or try different approaches that match your learning style or needs.

Active contribution is not about being the loudest voice. It's about showing up with care, engaging meaningfully, and helping create a space where everyone can learn. A question, a comment, or even a thoughtful nod of agreement can make a difference.

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Annex 2: Guide to Learnings reviews

During the first half of this course, you will complete **short, in-class activities** that will test your understanding and preparation. These reviews are designed to help you stay on track, reinforce your understanding, and build the skills you need to succeed in the course. Learnings reviews account for **10% of your final course grade**.

This guide explains how your answers will be evaluated and gives you example question types and model responses.

When and how will they be delivered?

Learning reviews **will take place during on-campus session**. They will usually take place at the beginning of class and test your understanding of the concepts and materials covered in previous sessions or your completion of the pre-class work and readings.

The purpose of the Learning reviews is to ensure you can remember key ideas so you can build on them in later sessions. These reviews consist of short questions you will **answer in 5–10 minutes** via a dedicated tab in the course's eCampus site.

How will they be scored?

Each Learnings Review is graded on an **A–E scale***:

Grade	Description
A	Fully correct, clear, and thorough response. All key points are accurately explained.
B	Mostly correct response with minor errors or missing some detail, but overall solid grasp.
C	Partial understanding shown; some key points are missing or inaccurate, but some correct.
D	Minimal or weak understanding, incomplete or largely incorrect answer.
E	No submission or completely off-topic or irrelevant answer.

At the end of the course, the **Learnings review score will be** calculated based on the average of all the scored activities.

* Learning reviews are individual, closed-book activities. You are not allowed to collaborate with classmates during the activity, use notes, textbooks, websites, or external tools (including AI tools like ChatGPT), or copy or borrow from any outside material. Violating this policy will be treated as academic misconduct and may result in a zero (E) for the considered activity or the entire grade component, formal reporting, or further disciplinary action as per the program's academic regulations.

What is expected in your answers?

- **Address all parts of the question**: If you are asked to evaluate or explain multiple aspects (e.g., effectiveness, efficiency, versatility), make sure you cover them all.
- **Provide reasoning**: When prompted to answer open questions, don't just write the answer, explain why it's correct. Partial answers, even if correct, will not receive full points unless properly explained.
- **Stay concise but complete**: Focus on the key points without unnecessary filler.
- **Demonstrate your thinking**: Even if you are unsure, demonstrating partial understanding can earn you a better grade than leaving it blank.
- **Be confident in your explanations**: Avoid vague or hesitant phrasing like "I think that…" or "maybe…" and aim for clear, direct answers.

Example questions and A-level answers

Here are examples of the kinds of reasoning and explanation we expect, using general, non-technical topics so you understand the structure of a strong answer.

- **Example 1: Comparing approaches**

  *Question***:** Imagine you need to calculate the area of a rectangle. You can either multiply length × width or add length + length + width + width. Which is more effective and why?

  Good answer (A-level): Multiplying length × width is more effective because it directly calculates the area in one step. The second method is not effective because it adds the sides, which gives you the perimeter, not the area. Only the first method gives the correct result.

- **Example 2: Explaining a concept**

  Question: Explain why dividing any number by zero is undefined in basic arithmetic.

  Good answer (A-level): Dividing by zero is undefined because there's no number you can multiply by zero to get a nonzero result. For example, 5 ÷ 0 asks: what number times 0 equals 5? But any number times 0 is 0, not 5. That's why the operation has no valid solution.

- **Example 3: Identifying an error**

  Question: A student claims that the average of the numbers 2, 4, 6 is (2 + 4 + 6) × 3 = 36. Explain the mistake and provide the right answer.

  Good answer (A-level): The student's mistake is multiplying by 3 instead of dividing by 3. To find the average, you add the numbers (2 + 4 + 6 = 12) and divide by how many numbers there are, in this case 3. Multiplying gives the wrong result. The correct answer is 12 ÷ 3 = 4.