UNIVERSIDAD DEL PACÍFICO

Format to prepare the syllabus of courses for the international week

The purpose of this document is to complete the information for the preparation of the syllabus of courses for the international week in the empty boxes.

Please complete the following mandatory fields requested in each of the boxes below:

I. General Information

Complete the following general information:

Name of the course:

Introduction to Operational Research

Teacher's name:

Waldemar Jan Florczak (Institute of Economics, Finance and Management, Jagiellonian University, Cracow, Poland

II. Introduction

Describe briefly, simply and synthetically what the course consists of and its formative scope. To do so, indicate what the course offers or provides to the student, mentioning its practical and theoretical usefulness.

Type the course introduction in the following box:

The course **Introduction to Operational Research** *aims to familiarise students of economics, management, and finance with the practical and quantitatively measurable benefits of analysing managerial and economic problems through formal models, data-driven constraints, and optimisation techniques. By emphasising how real-world decisions are shaped by quantifiable limitations and opportunities, the course highlights the central role of Operational Research in supporting efficient resource allocation and informed decision-making.* *Upon completing the course, students will possess a foundational understanding of key OR methods and will be better prepared to apply analytical reasoning to real managerial and economic challenges encountered in professional practice.*

III. Final Learning Achievement of the Course

The final learning achievement is a precise and assessable statement of what a student is expected to be able to do at the end of the course. They are essential for guiding the teaching process, assessing student progress, and verifying the acquisition and application of knowledge.

To develop the learning achievement of the course, consider the following elements to develop the final learning achievement of the course:

Write the final achievement of the course in the following box:

At the end of the course, the student will be able to formulate appropriate linear programming models for standard managerial optimisation problems, solve these models using suitable methods and software tools, and interpret the resulting solutions in a managerial and economic context.

IV. Learning Units

In this section **the final learning achievement of the course** is moved and the **thematic contents** and the activities and evaluations that will be developed are indicated.

Now, type the name of the course after "Learning Unit 1". Also, move the final learning achievement of the course under "Unit Learning Achievement", the contents to be worked on during the week as well as the activities and evaluations to be developed.

Learning unit 1: Introduction to operational research
Unit Learning Achievement: *Upon completion of Learning Unit 1, students will understand the practical and measurably cost-effective benefits of analysing the microeconomic business environment in terms of quantifiable constraints and opportunities. They will recognise why Operational Research provides a key analytical framework for supporting efficient resource allocation and rational managerial decision-making. As a result, students will be better prepared to address real managerial and economic problems in their professional practice.* **Contents:** The individual units of the lecture cycle called Introduction to Operational Research will cover the following issues: ● Introduction and interpretation of basic notions and concepts ● Exemplification of linear programming problem construction by means of the most typical models: diet problem, optimal production structure, stuff scheduling problem, cutting stock problem, location problem, transportation problem, product mix problem, blending problem, and multi-period planning problem ● Ways of solving LP models: graphical method, SIMPLEX method, and with a help of a computer package (using Solver in Excel) ● Elements of sensitivity analysis in practice (using Solver in Excel) **Activities and evaluations:** ● Debate ● Presentations

V. Teaching Strategies

The teaching strategies respond to the characteristics of the subject and the teaching methodology used by the teacher.

Below are some teaching strategies that can be selected. Write an "x" in the box corresponding to the teaching strategies you use in your course. If any of these strategies do not fit your course, add the strategy at the end of the list and describe it:

Teaching strategy	Type an x
Interactive presentation: *It consists of the explanation and demonstration of contents by the teacher, with the intervention of the students, either through questions or presentations of work prepared by the students.*	X
Exercise and problem solving: *It consists of asking students to solve exercises and/or problems by using formulas or algorithms, applying procedures and interpreting the results.*	X
Case studies: *It consists of an in-depth analysis of a fact, problem or real or hypothetical event in order to interpret it, generate hypotheses, diagnose it and solve it.*	
Group dynamics: *It consists of activities of a different nature conducted collaboratively between two or more students, whose purpose is to learn how the groups interact and thus facilitate experiential learning.*	
Structured debates/discussions: *It consists of moderating a systematically organized discussion of divergent opinions between two or more students on a topic or problem.*	
Role playing: *It consists of providing a real or simulated scenario in which students are required to assume fictitious or real roles with the intention that they can deploy all their abilities to resolve conflicts, as well as understand or experience a reality according to the role assumed.*	
Reflective dialogue: *It consists of the interaction of two participants who exchange ideas and opinions through a conversation with the purpose of reflecting critically and deeply on a specific topic. In this dynamic, students not only share their points of view, but are required to be open to listen and consider the other's perspective in order to build a more comprehensive understanding of the topics discussed.*	X
Collaborative learning: *It consists of providing instructions for students in small groups to exchange information and work on a task until all participants have developed an understanding of it (not necessarily the same) and have completed it.*	
Peer learning: *It consists of promoting collaborative spaces between a pair of students who exchange their knowledge, information, experiences and problem solving, being guided by the teacher (for example: students exchange their solutions between pairs, on an activity or exercise, before the teacher presents it to everyone).*	
Active learning: *It consists of encouraging students' participation and continuous reflection through activities aimed at deepening knowledge through interaction with the content, which involves the analysis and synthesis of information.*	X
Inverted classroom: *It consists of establishing pre-class activities for the review of conceptual materials and information (e.g., through videos, infographics, readings and other didactic resources), which allows students to prepare for a practical and active classroom session through collaboration, discussion and problem solving.*	
Experiential learning: *It consists of developing conditions for students to experience real or simulated situations (for example: debates, national or international learning visits, immersive experiences, internships, among others) that allow them to feel or perform actions and share them with their peers to strengthen their learning.*	
Service learning:	

Teaching strategy	Type an x
It consists of preparing students to apply the contents and tools provided by the course to the real needs of the community in order to develop a sense of social responsibility and, thus, improve their environment.	
Spaces for creation: *It consists of facilitating physical or virtual spaces for students to create projects or prototypes based on computer programs or physical tools (for example: game labs software, design software, innovation labs, 3D printers, laser cutters, among others).*	
***Design thinking*:** *It consists of the development of solutions or products focused on the needs of users, through strategies and tools (for example: empathy map, user journey, Canva, among others) that allow students to develop their empathy to understand the environment, generate ideas and solutions, as well as prototyping solutions or products that can be tested and adjusted to achieve user satisfaction.*	
Problem-based learning: *It consists of posing a complex real-world or hypothetical problem formulated by the teacher, with the intention that students (usually in groups) gather more information and analyze the problem in order to propose solutions.*	
Research-based learning: *It consists of connecting teaching with research through the application of scientific concepts, theories and methods in order to generate new knowledge about a particular aspect of reality or the exploration of an unknown phenomenon in order to suggest theoretical or methodological guidelines for its approach.*	
Project-based learning: *It consists of the design and development of projects (generally in groups of students) with the purpose of having the student manage a set of planned, interrelated and coordinated activities to achieve an objective within a given time frame.*	
Challenge-based learning: *It consists of providing a situation or general context in a social or physical environment so that students can collaboratively choose a challenge to be solved based on the learning of the contents offered by the course.*	
Gamification of learning: *It consists of developing a physical or virtual learning environment by applying the principles and elements of the game in order to encourage student motivation and participation.*	
Write other strategies not contemplated in the previous list that you need to detail:	

VI. Evaluation System

In this section, write the names of the evaluations to be used in the course in a manner consistent with the final learning achievement of the course, as well as the percentage of weighting that each type of evaluation will have in the final score, which should add up to 100%.

Considerations for evaluations

Attendance is essential for the evaluation activities to be graded.

Name of evaluation	%	Comments
Written exam	100%	To get a promoting grade the student has to score at least 50% of the best student's score but not less than 30% of the total score (100 points). During the final examination, students may use pocket calculators and the list of formulae approved by the lecturer, as well as any materials distributed to them throughout the course. The use of mobile phones or AI tools is strictly prohibited during the exam.

VII. References

This section should indicate the sources and resources of information, indicating the required and recommended readings. It is necessary to consider that this material must be available to the students and must contemplate safe and reliable links that are unlikely to change domain, for example, DOI, handle, reliable websites, etc. Likewise, avoid considering class handouts, teacher's notes, evaluations, among other teacher's own work materials that are not referenced.

Then, write in the corresponding box the bibliographic references to be used in the course.

Mandatory: list the references that you consider mandatory for the course.

Hillier, F.S., Lieberman, G.J., (2015). *Introduction to Operations Research* (10th edition). Mc Graw Hill Education

Recommended: list the references that you consider suggested for the course

Carter, M.W., Price, C.C., Rabadi G., (2019). *Operations Research. A Practical Introduction* (2nd Edition) . CRC Press. Taylor & Francis Group

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