Universidad Tecnológica de Pereira

Facultad de Ciencias Empresariales

Mastery in Operations Research and Statistics

SNIES CODE: 115859
QUALIFIED REGISTRATION: Resolution No. 08020 / May 24, 2018 with a validity of 7 years.
-High Quality Re-Accreditation: Resolution Number 015864 of August 25, 2021, valid until 2027.
-EUR-ACE Re-Accreditation from October 2022 valid until August 2026: agency authorized by the European Network for Accreditation of Engineering.



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For more information about
The Master's Program in Operations Research and Statistics,
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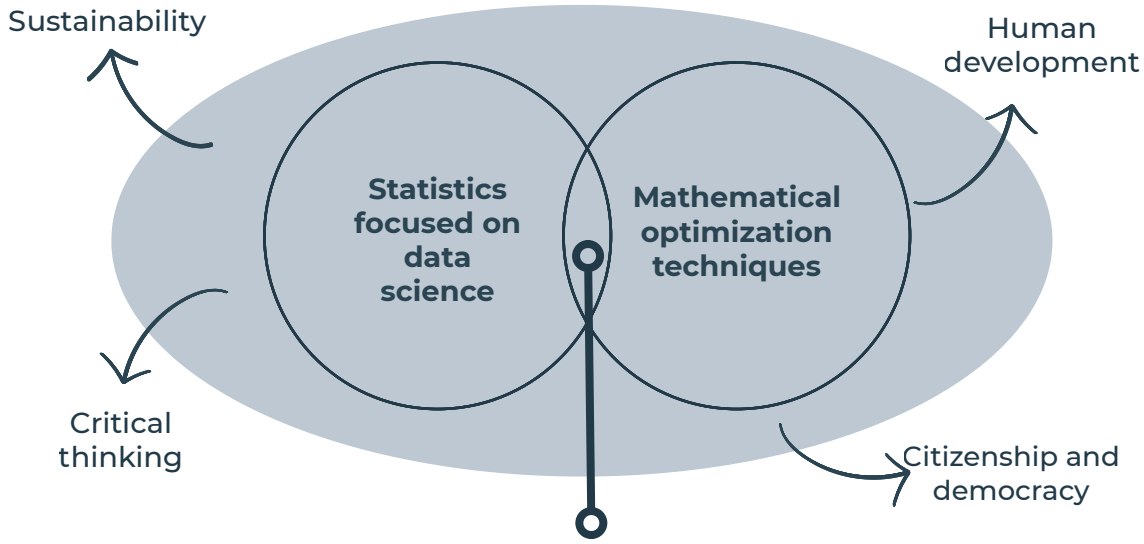
Web:

MIOE GRADUATE PROFILE

- Analyze and solve engineering problems
- Personal skills and attitudes
- Professional skills and attitudes
- Multidisciplinary work
- Effective communication
- Communication in foreign languages (English)
- External and social context

+

Experimentation and discovery of knowledge	=	Researcher
Systems thinking Engineering systems and design	=	Systems Designer
Design and implementation	=	Process designer
Operation	=	Product process support or operations designer
Companies and business context	=	Engineer or business manager



Master's degree in Operations Research and Statistics / Data Science

It presents **methodologies of operations** research and statistics **to apply** them in the search **for optimal solutions** to **problems** specific to **engineering** and **society.**

-Postgraduate program approved in its beginning by Resolution No. 00018 of September 1986.

-Renewal of Qualified Registration for 7 years according to Resolution No. 08020 of May 24, 2018.

-High Quality Accreditation according to Resolution No. 14012 of July 11, 2016 of the Ministry of National Education for four years.

The Master's program began in the first semester of 1987 and is offered in the city of Pereira. Throughout its history, it has established itself as the only Master's program in the country that focuses on operations research as its central object of study, along with the study of multivariate statistical analysis techniques.

It offers professionals in-depth training so that they can lead research processes and the application of mathematical techniques in operations research and multivariate statistics, in all areas of human activity, engineering, administration and academia.

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Program Objectives

The Master's Program in Operations Research and Statistics has established its objectives in accordance with the Institutional Educational Project (PEI) and the University's Mission, complying with national regulations and in line with the needs of the region, employers, and those interested in the program.

OP1. Analyze and combine knowledge and techniques of statistics and mathematical optimization under sustainable approaches, with the aim of making informed decisions, essential to address current and future challenges in academic and business environments.
OP2. Identify effective tools and approaches for the use of organizational resources in order to optimize their processes, combining operations research and statistical practices, which allow for improved efficiency, optimized decision-making, prediction of trends, and maintenance of competitiveness in an increasingly complex and data-driven market.
OP3. Analyze and extract various significant insights from multivariate statistical approaches, both qualitative and quantitative, to simultaneously examine multiple variables or factors in a data set, with the aim of obtaining
More complete and in-depth information on the relationships and patterns between them, applied in different fields, such as scientific research, engineering, economics, medicine, among others.
OP4. Integrate operations research and statistics to promote a more comprehensive and robust approach, in order to address research challenges by considering operational efficiency, as well as the uncertainty inherent in data and processes under a framework that contemplates ethical, moral and scientific rigor.
OP5. To foster human dimensions that allow for participatory spaces for dialogue and reflection with a sustainable approach, contributing to the training of professionals capable of addressing challenges in a comprehensive and responsible manner.

Master in
Operations Research and Statistics

2 Years

Day
Friday 6:00 p.m. to 10:00 p.m.
Saturdays 8:00 a.m. to 3:00 p.m.

Number of Credits
54

Admission
By cohorts

6 SMMLV

Our Mission

This program prepares graduates to be leaders in solving complex problems across a wide range of industries, using sound quantitative approaches based on efficient data analysis. By integrating Operations Research and Data Science, the program aims to empower professionals to drive innovation, efficiency, and sustainable growth in an increasingly interconnected and data-driven world.

Learning Outcomes

The learning outcomes of the program, unlike the program objectives, are directly related to the student and their achievements. They are assessable and often observable (or their consequences are, for example, through what a student knows and can demonstrate through activities that require specific knowledge). Learning outcomes are statements of what a student is expected to know, understand, and/or be able to do at the end of a learning period. In learning outcomes, the student is the subject of the action, the protagonist, the one responsible.
The following are the learning outcomes of the program:

RAP1. Integrates knowledge of statistics and mathematical optimization with a sustainable approach to make informed decisions that address current and future challenges in academic and business contexts.
RAP2. Identify and apply effective operations research and statistical tools and approaches to optimize processes, improve efficiency, make informed decisions, predict trends, and maintain the competitiveness of organizations in a data-driven and constantly changing market.
RAP3. Applies multivariate statistical approaches from specialized statistical software to analyze data sets with multiple variables, interpret complex relationships, extract meaningful knowledge, and effectively communicate results in different fields of application.
RAP4. Integrates operations research and statistics to address research challenges in a comprehensive and robust manner, considering operational efficiency and uncertainty within a rigorous ethical, moral, and scientific framework, thereby contributing to the fulfillment of policies promoting research in areas of relevance and high impact.
RAP5. Conduct a critical evaluation of scientific articles, using specialized global databases, with the aim of fostering interdisciplinary discussions within the academic environment. This practice will contribute to enriching current knowledge in the field of research and strengthening the evolution of your own project by incorporating broad and varied perspectives.
RAP6. Create engineering-based designs that employ mathematical tools to conceive, plan, simulate, model, and monitor all operations that optimize resource utilization according to predefined objectives. These designs incorporate principles of sustainability, social responsibility, citizenship, and democracy to guide decisions in a comprehensive and informed manner.
RAP7. Interacts in spaces of dialogue and reflection, where he/she proposes solutions to current challenges, through his/her knowledge and the principles of sustainability, social responsibility, with civic and democratic commitment.

Our Vision

By 2028, the program aims to be a pioneering graduate program that transcends the traditional boundaries of Operations Research and Data Science by incorporating a robust approach to advanced research. The program strives to be a leader in knowledge creation and in training experts and leaders who are at the forefront of transformation across diverse industries and sectors.

Graduate Profile

Graduates of the Master's program in Operations Research and Statistics will be able to:

- Integrate knowledge of statistics and mathematical optimization to address current and future challenges in academic and business contexts.
- Identify, apply and communicate operations research and statistical tools and approaches, enabling the optimization of processes, improved efficiency and maintenance of organizational competitiveness.
- Apply multivariate statistical approaches using specialized software to analyze datasets with multiple variables and interpret complex relationships.
- Integrate operations research and statistics to address challenges holistically, considering operational efficiency and uncertainty.
- Critically evaluate scientific articles using specialized databases at a global level, contributing to interdisciplinary discussions.
- Create designs based on engineering principles that use mathematical tools to optimize resource utilization and make informed decisions.
- Participate in dialogue spaces, proposing solutions to current challenges through principles of sustainability, social responsibility, civic and democratic commitment.

What do you need to join the program?

The Master's program is aimed at professionals who want to delve deeper into ways to optimize the use of resources that a company, institution, or system, in general, uses to make it more competitive, applying models and tools of operations research and multivariate statistics.

Teachers

The program has 12 faculty members, 10 with PhDs and 2 with Master's degrees, all trained in academic fields relevant to the Master's in Operations Research and Statistics. All are experienced in higher education and committed to supporting students and guiding them throughout their academic journey. To learn more about our faculty, please visit our website:

Scan me to learn more!

CURRICULUM

Master's Degree in Operations Research and Statistics

BASIC TRAINING SUBJECTS - IOF03

- IO8E4 – Forecasting Techniques and Time Series
- IO2F3 – Metaheuristic Techniques
- IO173 – Fundamentals of Discrete and Continuous Simulation
- IO4F3 – Statistical Design of Experiments
- IO5F3 – Integer Linear Programming
- IO6F3 – Multivariate Data Analysis
- IO8F3 – Advanced Data Visualization
- IO9F3 – Unstructured Data Analysis
- IO7F3 – Stochastic Optimization

BASIC LEVELING SUBJECTS - IO000

- IO1N1 – Statistics in R
- IO2N2 – Operations Research
- IO3N1 – Programming Language

ELECTIVE CORE SUBJECTS - IOE001

- BIOG53 – Discrete Optimization in the Vehicle Routing Problem
- IO3E3 – Nonlinear Programming Techniques
- IO53 – Natural Language Processing Techniques
- IO5E3 – Categorical Data Analysis
- IO7E3 – Random Processes
- IO6E3 – Data Exploration Techniques
- IO1F3 – Envelope Data Analysis
- IO273 – Computational Implementation in Multi-Objective Optimization
- IO9E3 – Deep Learning
- IO10E3 – Multi-criteria Decision Analysis
- IO11E3 – Cybersecurity and data privacy

SEMI-ANNUAL ORGANIZATION

1
Statistics in R Leveling Course
Programming Language Leveling Course
Basic training: 6 credits

2
Training basis: 9 credits
Elective I
Seminar I

3
Leveling Course in Operations Research
Basic training: 9 credits
Seminar II

4
Basic training: 3 credits
Elective I and II
Graduation project

GRACE PERIOD + 2 YEARS

Master's Degree in Operations Research and Statistics

SNOW 115859

Resolution No. 08020 / May 24, 2018, duration 7 years



What are you waiting for to gain new skills and knowledge?

More information about the program

Master's Program in Operations Research and Statistics, Faculty of Business Sciences - UTP, Building No. 5, Office 5-209. Web: https://industrial.utp.edu.co/maestrias/investigacion-operativa/ homepage.html Email: ioe@utp.edu.co Phone: (57) (6) 313 7372 / WhatsApp: 3245800647 Instagram: @maestria.ioe

REGISTRATION

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www.utp.edu.co/inscripciones/

Universidad Tecnológica de Pereira
Vigilada Mineducación
Resolución 12220 de 2016

Síguenos en: UTPereira

Do you need financing to pay for your tuition?

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