



Universidad Tecnológica  
de Pereira

Faculty of  
Business Science

# ¡Sign up!

## MASTER'S DEGREE IN **Operational Research and Statistics**

CODE SNIES: 279



**Welcome**  
**TO A WORLD**  
**of endless**  
**EXPERIENCES**

# Presents methodologies of **operations research** and statistics to apply **in the search of** optimal solutions **to specific problems** for engineering and society

*-Postgraduate program approved in its initiation by Resolution No. 00018 of September 1986  
-Renewal of Qualified Registry 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.*

Our Master Degree Program began in the first semester of 1987, it is offered in the city of Pereira and in the modality of extension in the cities of Bogotá and San Juan de Pasto. During its trajectory, it has consolidated as the only Master's program in the country that deals with operations research as a central object of study together with the application of multivariate statistical analysis techniques.

It offers in-depth training to professionals to lead research processes and to applicate mathematical techniques of operations research and multivariate statistics, in all action fronts of human activity, engineering, administration and the academy.

**CÓDIGO SNIES: 279**

**REGISTRO CALIFICADO:**

Resolution No. 08020 of May 24, 2018 for seven (7) years.

## Program Objectives

The Master's Degree in Operational Research and Statistics has established its objectives in correspondence with the Institutional Educational Project and the University's Mission Statements, complying with the national norm and in coherence with the needs of the region, employers and those interested in the program.

The program objectives are directly related to the focus, purposes and intentions behind the program from the perspective of the institution. In the teaching objectives of the program, the action subject is the institution and its teaching team.

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**OP1.** Offer in-depth training to professionals interested in leading research processes and the application of techniques of Operations Research and Statistics, in the fronts of Engineering and academia



**Master's Degree in  
Operational Research and Statistics**



**2 Years**



**Schedule**

**Fridays from 6.30 p.m. to 9:30 p.m.  
Saturdays from 8:00 a.m. to 12:00 noon and  
from 1:00 p.m. to 4:00 p.m.**



**Number of credits**

**54**



**Admissions**

**By cohorts**



**8.25 SMMLV (Minimum Monthly Legal  
Wage in Colombian Pesos)**

**OP2.** Present ways to optimize the use of resources that a company uses to make it more competitive, applying models and tools of operations research and statistics

**OP3.** Present qualitative and quantitative multivariate statistical techniques aimed to support the decision making processes in the fields of engineering, taking into account the global context of society.

**OP4.** Promote research on issues related to operations research techniques and statistics, taking into account ethical, moral and scientific rigor

## Our Mission

We are a program that develops and promotes research processes and the deepening of knowledge in the field of Operations Research and Multivariate Statistics, training professionals who lead optimization processes in any area of the human activity through the application of these mathematical tools.



## Our Vision

To be a program of high academic and research quality, linked to national and international networks of researchers in the area of the program, with an international curriculum that generates economic and social development by optimizing processes in the environment over which it acts.

## Program learning results

The learning results of the program, unlike the objectives of the program, are directly related to the students and their achievements. They are evaluable and often observable (or their consequences, for example, through what a student knows and can demonstrate through activities that require certain knowledge). The learning results 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 the learning results the subject of the action, the protagonist, and the responsible is the student.

The following are the learning results of the program:

**RAP1.** Understand different operations research techniques to support decision making in any sphere of professional activity (understanding level)

**RAP2.** Understand different techniques of Multivariate Data Analysis to analyze large data sets in order to understand the reality behind them (analysis level)

**RAP3.** Apply mathematical tools of Operations Research and Statistics in solving complex engineering problems that arise in organizations according to their specific policies and requirements (application level)

**RAP4.** Solve quantitative and/or qualitative engineering problems based on models, techniques and appropriate tools of Operations Research and Statistics according to organizational requirements (application level)

**RAP5.** Apply appropriately different mathematical and statistical methodologies to support optimal decision making in engineering at different contexts in the organization (synthesis and evaluation level)

**RAP6.** Design research, innovation and development projects in organizations using the knowledge acquired in the operations research area, taking into account the ethical, moral and scientific rigor, in accordance with the policies established by them and the requirements of the environment with a national and international perspective

**RAP7.** Schedule industrial production and operations in any type of organization of goods and / or services taking into account the national and international context (evaluation level)

**RAP8.** Undertake research, innovation and development projects in organizations using the knowledge acquired in the area of operations research in accordance with the policies established by them and the requirements of the environment with a national and international perspective (synthesis level)

**RAP9.** Coordinate research processes based on organizational and engineering requirements (synthesis level)

**RAP10.** Employ support software for Operations Research and Statistics models to provide the solution of the models (application level)

**RAP11.** Perform a critical analysis of scientific articles for interdisciplinary discussion with the teacher and classmates to strengthen the state of the art of their research

**RAP12.** Develop engineering designs, understood, as processes where mathematical tools are applied to conceive, project, design, simulate, model and direct all type of activities that transform resources optimally according to established objectives.

## Graduate Profile

The graduates of this master program will be able to:

- Analyze and study different optimization methodologies for their subsequent application in the solution of problems, in the different areas of Engineering and Administration.
- Propose models of operations research searching for the optimal solution to problems in any area of human activity (engineering, administration, production, services, etc.)
- Overtake discrete and continuous simulation studies to support decision making.
- Process and analyze statistical data for decision making.
- Construct and develop forecast models to estimate the values of variables in any context of interest.
- Exercise as a university professor in the areas of operations research and multivariate statistics.
- Formulate and develop research projects in the thematic of the program or related.

## What you need to join to the program

Our Master's Degree is aimed at professionals who want to delve into the 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 teachers, 10 with a doctorate or PhD degree and 2 with a master's degree. All them skilled in the field of higher education, and committed to support students during the academic processes.

**To know more about our teaching staff, visit our web page:**  
**<https://industrial.utp.edu.co/maestrias/investigacion-operativa/inicio.html>**

# SYLLABUS

SEMESTER	Course Code	Courses	Number of Hours per week	Number of Credits
1	I0113	Advanced Linear Programming	10	3
	I0123	Multivariate Analysis	10	3
	I0133	Design of Experiments	10	3
	I0143	Simulation of Dynamics Systems	10	3
2	I0213	Non-linear Programming	10	3
	I0223	Metaheuristics	10	3
	I0233	Financial Optimization	10	3
	I0243	Data Envelopment Analysis (DEA)	10	3
3	I0313	Categorical Data Analysis	10	3
	I0323	Elective I (Forecasts and Time Series)	10	3
	I0333	Elective II (Stochastic Processes)	10	3
	I0346	Thesis I	--	6
4	I0412	Elective III (Data Mining)	10	3
	I0512	Thesis II	--	12
Total:			110	54

# Master's Degree in Operations Research and Statistics

Resolution No. 08020 of May 24, 2018 for seven (7) years

/CODE SNIES 279



## Sign up NOW!

Click  
HERE



### For more information about the program

Faculty of Business Science - UTP  
Building N° 5 Office number 5 - 209  
Address: Cra. 27 10-01 Los Álamos - Pereira-Risaralda-Colombia  
Program's web page: <https://industrial.utp.edu.co/maestrias/sistemas-gestion-calidad/inicio.html>  
Email: [ioe@utp.edu.co](mailto:ioe@utp.edu.co)  
Contact us: (57) (6) 313 7372

### Registration

Admissions, Registration and Academic Record's Office - Building 3 – UTP  
Email: [inscripcion@utp.edu.co](mailto:inscripcion@utp.edu.co)  
Tel: (57) (6) 313 71 39 - Switchboard (57) (6) 313 73 00  
Exts: 7176 - 7177 - 7178 - 7179 - 7182 - 7183  
UTP Address: Cra. 27 N° 10 - 02 Los Álamos - Pereira - Risaralda - Colombia

[www.utp.edu.co/inscripciones/](http://www.utp.edu.co/inscripciones/)



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### Information FASUT

Do you need financing to pay your tuition?

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