



Universidad Tecnológica
de Pereira

Faculty of Engineering

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MASTER'S DEGREE IN

Computer Systems Engineering

CODE SNIES: 54928

Welcome
TO A WORLD
of endless
EXPERIENCES

Learn **about the** high capacities **of research** in Computer **Systems** Engineering

-Graduate program created by the Agreement No. 40 issued by the Honorable Superior Council of Universidad Tecnológica de Pereira

Our Master's Degree in Computer Systems Engineering is based on the critical and analytical reflection of the regional and national context, it is consistent with the socio-economic situation where the program takes direct action, the addressed government policies, the world trends and the new technologies applied in the teaching-learning process.

This program began in 2009, with outstanding results in Risaralda; we have trained great professionals that generated a positive impact in the region and it has also created extension projects

CODE SNIES: 54928

OFFICIAL REGISTRATION:
Resolución N° 08435 / April 28, 2016.



**Master's Degree in
Computer Systems Engineering**



4 Semesters



**Schedule
Mixed**



**Number of credits
58**



**Admisión
Semi-annual**



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

Program Objectives

OP1. Promote training spaces for real and applied research supported by Computer Sciences.

OP2. To train competent and committed professionals with the development of solutions according to international methodologies and standards.

OP3. Encourage research processes aimed at the use of computational resources and the efficient use of available processing devices.

OP4. Allow the student to understand the processes that are given to guarantee the exchange of information and data through engineering solutions.

Our Mission

Is to direct this area's research at regional, national and international levels, by training graduates with high investigative capabilities, with ethical principles, equity and leadership, toward enhancing regional development.

Our Vision

Is to be the leading Master's program in the region, well known by its high quality research groups that can impact the region's social and economic development.

Learning Outcomes

- **RAP1.** Propose specific techniques that facilitate the construction of innovative software products, capable of successfully competing in the global environment.
- **RAP2.** Develop new methodologies and software modeling tools.
- **RAP3.** Use methods, technologies and good software development practices.
- **RAP4.** Identify and expose quality criteria in the software development process.
- **RAP5.** Approach new techniques of High Performance Computing to the general scientific community.
- **RAP6.** Evaluate high performance computing techniques that allow to verify their relevance in the solution of computationally costly problems.
- **RAP7.** Develop algorithm parallelization strategies that contribute to the state of the art of high performance computing.
- **RAP8.** Propose the articulation of High Performance Computing techniques with Machine Learning techniques.
- **RAP9.** Develop mathematical models for the analysis and processing of signals to understand phenomena in the domain of time and frequency.
- **RAP10.** Diagnose problems related to the transport of data through communication systems.
- **RAP11.** Propose new communication protocols, which allow to optimize network resources or help to implement specific purpose services.
- **RAP12.** Generate alternatives for information security, through new methodologies, processes, implementation of algorithms and their optimization.
- **RAP13.** Solve engineering problems using methodologies based on basic mathematical concepts.
- **RAP14.** Establish conversations in technical areas in English language.
- **RAP15.** Perform teamwork and lead research processes.
- **RAP16.** Differentiate projects or products that can threaten the healthy development of society.
- **RAP17.** Knowing computer techniques that guarantee an efficient use of energy trying to maximize the computing capacity without affecting the power consumption of the systems.
- **RAP18.** Write and publish research or application articles about any of the research lines of the master's degree.

Graduate Profile

The Master of Research program seeks the advanced development of Competencies for the graduate:

- Analyze, understand and interpret phenomena and engineering processes associated with your emphasis line.
- Identify, classify and systematize scientific literature for the analysis and solution of a research problem.
- Know, understand, interpret and critically argue the scientific literature of their line of knowledge.

- Use and generate modern scientific techniques, theories, practices and tools to solve engineering problems in your line of emphasis.
- Appropriately use the method of scientific research in an autonomous and proactive way in the development and management of research projects.
- Develop and direct research projects.
- Participate in multidisciplinary research groups.
- Apply and generate new knowledge in your area of emphasis through the development of research projects.
- Identify and propose alternatives to problems associated with your work area.
- Innovate, evaluate, optimize and conceive the use of new solution methodologies applied to real-life problems in your area of emphasis.
- Recognize the impact of scientific engineering solutions in the global context of society.
- Recognize the ethical and scientific rigor of your research work.
- Incorporate knowledge of other disciplines associated with the research carried out in your area of work.
- Produce results of advanced level research with significant contributions to the state of the art.
- Participate in teaching activities.
- Present the results of your research at national and international symposia or conferences.
- Disseminate the results of your research in scientific publications with a high impact factor, recognized nationally (B, A1, A2) and internationally (Q1-Q4).
- Use technical-scientific language appropriate to the international context in your presentations and in your written reports.

What you need to join to the program

Our Master's program is intended for professionals in the field of Engineering specially in Computer Systems Engineering, Software, Electrical, Electronic, Mechatronics, Industrial, Physicists, Mathematicians and of related areas who want to expand the curriculum experience in Artificial Intelligence with emphasis on Data Analytics and Optimization, Software Engineering with emphasis on Software Architecture and Requirement Engineering, High-Performance Computing and Data Networks and Communications.

Teachers

We have a highly qualified group of teachers with great academic excellence, which guarantees the quality of our program. To know more about our teaching staff, visit our web page:

<https://ingenierias.utp.edu.co/maestrias/ingenieria-en-sistemas-y-computacion/inicio.html>

SYLLABUS

Master's degree in Computer Systems Engineering

Semester	Course Code	Courses	Number of credits
1	AY164	Mathematics for Computer Science I	4
	AY184	Multivariate Analysis	4
	AY114	Computational Complexity	4
	AY153	Research Methodology	3
2	AY274	Mathematics for Computer Science II	4
	AY254	Optimization	4
	AY001	Elective I	4
	AY283	Research Seminar	3
3	AY002	Elective II	4
	AY003	Elective III	4
	AY372	Seminar I	2
	AY354	Graduation Project I	4
4	AY004	Elective IV	4
	AY005	Elective V	4
	AY472	Seminar II	2
	AY454	Graduation Project II	4
TOTAL			58

Master's Degree in Computer Systems Engineering

Official Registration 08435 / April 28 of 2016

/SNIES CODE 54928



Sign up NOW!

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For more information about the program

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Building N° 15 Office number 15C - 104
Address: Cra. 27 10-01 Los Álamos - Pereira-Risaralda-Colombia
Program's web page: <https://univirtual.utp.edu.co/sitio/maestria-educacion>
Email: a.hincapie@utp.edu.co
Contact us: (57) (6)313 7489

Registration

Admissions, Registration and Academic Record's Office - Building 3 – UTP
Email: 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/



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Resolution 12220 of 2016

Information FASUT

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Visit: www.utp.edu.co/fasut
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