



Universidade Federal de Santa Catarina
Centro Tecnológico
Departamento de Engenharia Mecânica

Strategic Planning – EMC 2016 - 2025

Strategic Planning Commission at EMC:

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Orestes Alarcon; Victor J. De Negri;

Florianópolis, 17-11-2015

Diagnosis demanded by the Head of the Department:

1. Identify **marked demands and required qualifications** for engineering professionals;
2. Identify **perspectives related to governmental policies and to technological innovation** (industry);
3. Identify **current potentialities and fragilities of EMC** in terms of Areas of Actuation;
4. Identify good **practices of laboratory and faculty structuration** in departments of reference;
5. Recommend **strategies for faculty admission, research and infrastructure** for EMC;
6. Identify participation of **EMC faculties in decision positions at university and public policy definitions at government level.**

Genesis: The First Vision of Future - 1962

Faculty of Industrial Engineering – Mechanical, Chemical, Electrical

Vision:

“make a great school, and his fame goes so that when a parent in the Amazon say that your soon will study engineering, the surrounding people advise: send him to Florianopolis, that there is the best”

”fazer uma grande escola, e que sua fama corra de tal forma que quando um pai no Amazonas disser que seu filho vai estudar engenharia, os circunstantes aconselhem: mande-o para Florianópolis, que lá está a melhor”

citation of Jurandyr Lodi – Director of Higher Education of MEC,

according to Prof. Ferreira Lima, 1962.

(Departamento de Engenharia Mecânica, 2008, p12.)

Last Strategic Planning: 2005-2015

“The Mechanical Engineering at UFSC will be a benchmark of excellence in teaching, research and university extension, preparing the most disputed competent professionals and entrepreneurs in the market and generating advanced knowledge demanded by strategic productive sectors and major national projects.”

“A Engenharia Mecânica da UFSC será referência de excelência em ensino, pesquisa e extensão universitária, formando os profissionais competentes e empreendedores mais disputados no mercado e gerando conhecimentos avançados demandados por setores produtivos estratégicos e por grandes projetos nacionais.”

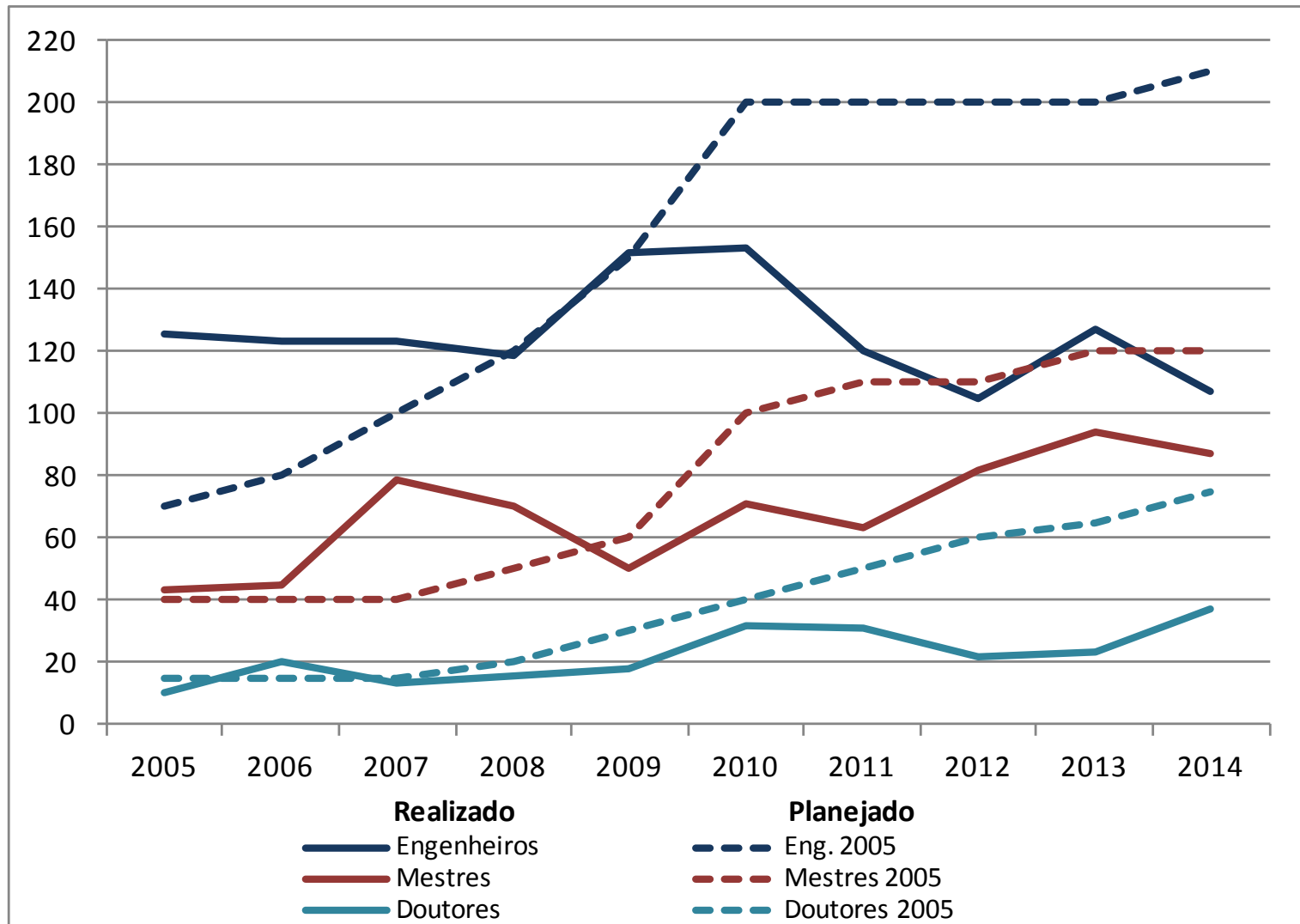
Last Strategic Planning: 2005-2015

Strategic Areas:

- Efficient energetic systems – SEE;
- Products and systems with high technological content– PCT;
- Material with high performance – MED;
- Advanced processes and production systems – PPA.

Diagnosis

Goals for education of engineers, Masters, and Doctors: Planned and Executed



Actions for the future strategic planning:

1. Meeting with Dr. André C. Bittencourt - Coordinator for Brazil relations and Prof, Petter Krus - Head of Division of Fluid and Mechatronic Systems, both from Linköping University, Sweden ;
2. Meeting with the coordinators of the undergraduate and graduate programs of EMC;
3. Meeting with Prof. Carlos A. Schneider – CEO of CERTI and Dr. José E. Fiates – Executive Director of Sapiens Parque;
4. Workshop with Prof. Dr. Luis Bevilacqua - COPPE/UFRJ, Eng. Roberto Campos – CEO of EMBRACO, and Dr. Glauco José Côte – President of FIESC;
5. Workshop with Eng. Marcelino Guedes – Petrobrás and Prof. Jesualdo P. Farias – Secretary of Higher Education of MEC.

The following drivers were identified :

Innovation

Sustainability and environment

Self-determination (it might be autonomy)

Quality and communication

Entrepreneurship and spirit of business

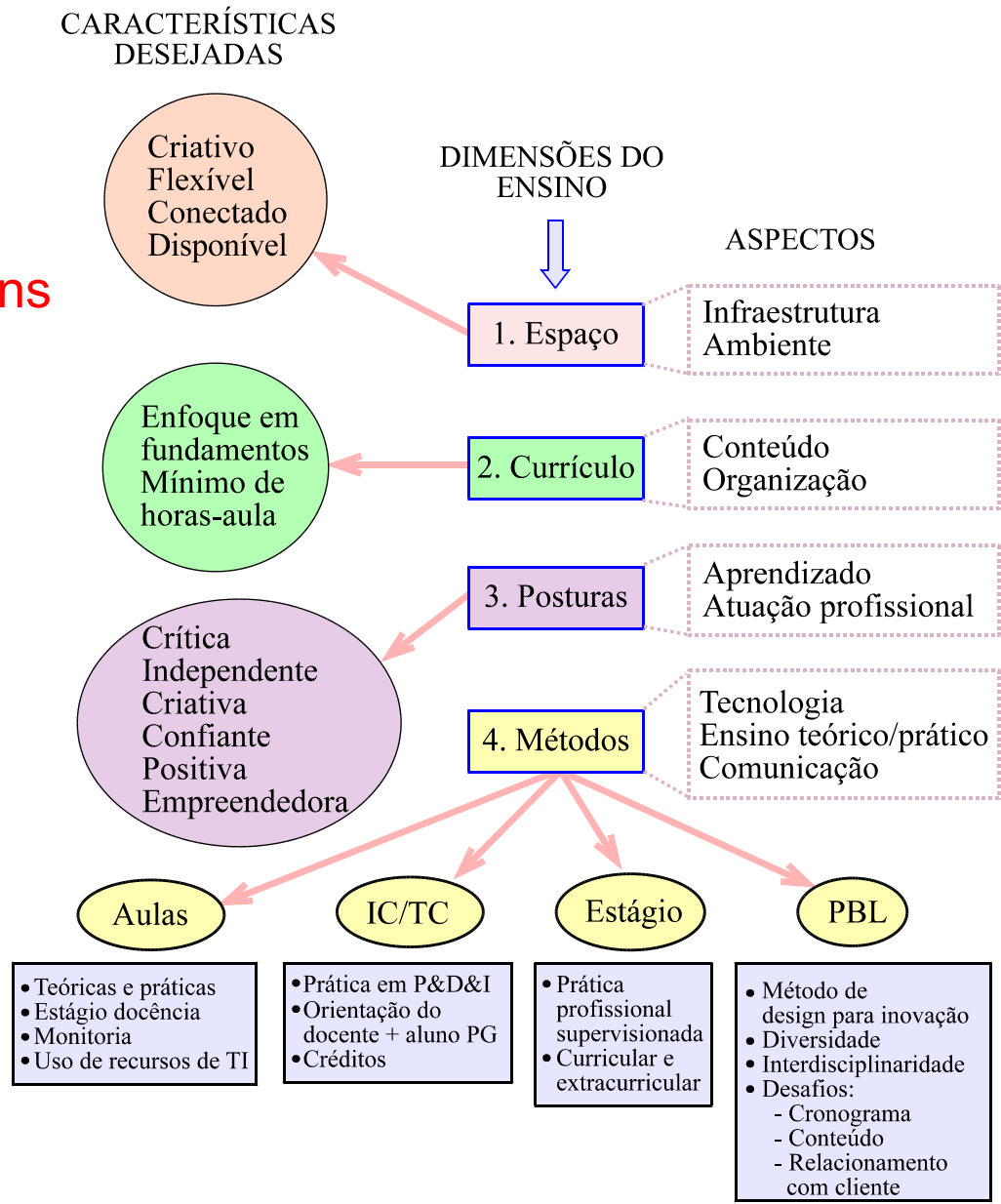
Governance

New teaching and learning technologies

Infrastructure

Model 1:

Correlation among dimensions of teaching and learning



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Model 3

Teaching and Learning:

1. Classes by internet: Classical theoretical subjects available at internet: Classrooms for group projects;
2. Implementation of CDIO approach: Conceive, Design, Implement, and Operate;
3. Transversal courses of scientific content in the 2 first years, substituting classical courses of physics, chemistry and mathematics (ex. Chemistry of polymers..);
4. Cooperative model: Internships at industry as part of the learning process;
5. Last two years at Sapiens Parque: Specialization on Industry of the future, energy, Sustainability.....

Model 3

Research:

1. To correlate the current knowledge offer and the demands of the Brazilian and world society
2. To provide solid bases of knowledge and scientific research;
3. To stimulate research on transversal technologies: Artificial intelligence; Sensors and actuators; biomedical engineering, biotechnology...

Governance and Infrastructure:

1. Create a Technology Institute at Sapiens: Engineers capable to work on general national problems

Federal University of Santa Catarina

Current Researches on Aeronautics

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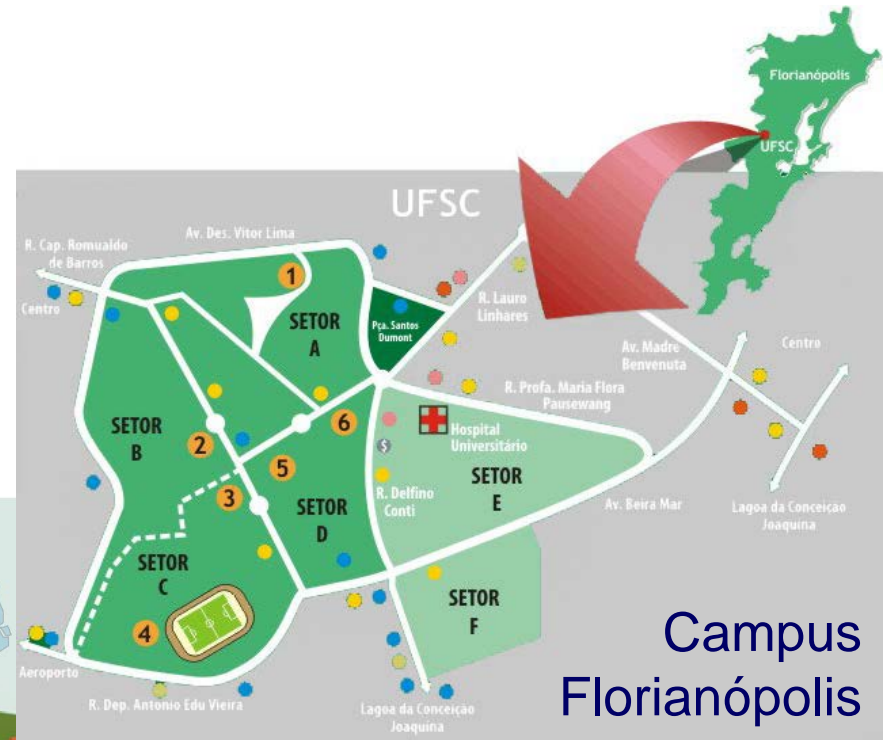


UNIVERSIDADE FEDERAL
DE SANTA CATARINA



Federal University of Santa Catarina

*Aeronautic
teaching and
research*



Campus
Florianópolis

Laboratories



Turbulence and jet noise

Cesar J. Deschamps (deschamps@polo.ufsc.br)



Noise and vibration control on aircrafts, aeroacoustics and numerical methods.

Arcanjo Lenzi (arcanjo.lenzi@ufsc.br)



Lattice-Boltzmann and Gas Kinetic Methods for flow simulation

Juan P. L. C. Salazar (juan.salazar@ufsc.br)



Efficient hydraulic systems

Victor J. De Negri (victor.de.negri@ufsc.br)



Alternative aviation fuels

Amir A. M. Oliveira Jr.
(amir.oliveira@ufsc.br)



Loop heat pipes for thermal control

Kleber Paiva (kleber.paiva@ufsc.br)





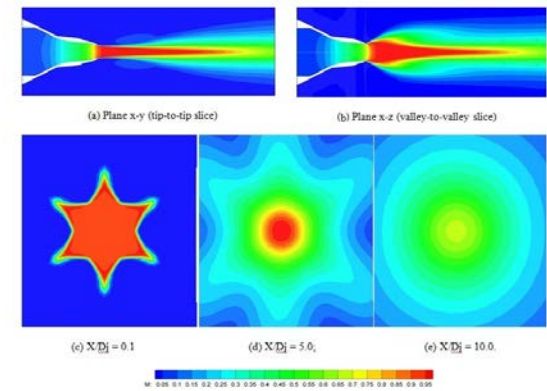
Team

on aeronautics

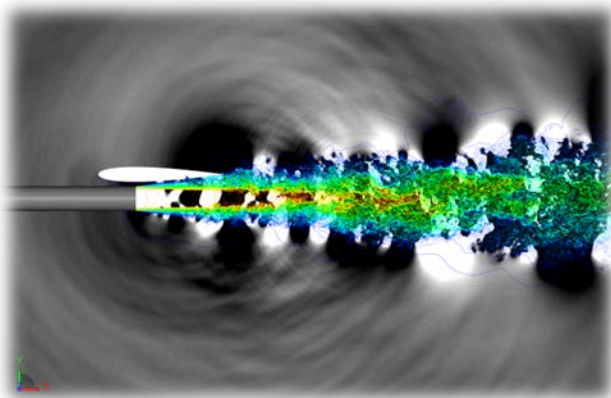
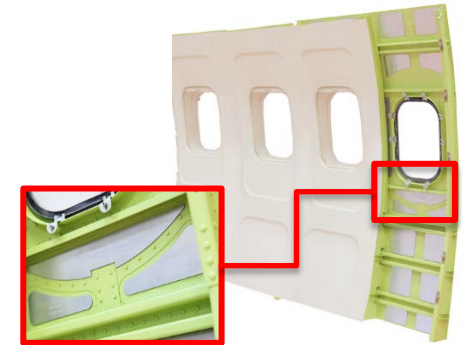
~30 persons

- 8** professors
- 7** Ph.D. students
- 5** M.Sc. students
- 10** B.Sc. Students
- 1** technicians
- 2** staff

Research



- Numerical and experimental investigation of noise and installation effects of subsonic jets.
- Liner impedance education
- Digital hydraulic principles applied for surface control actuation
- Application of beamforming techniques for source localization
- Noise control of air-conditioning and hydraulic systems
- Lattice-Boltzmann (LBM) and Gas Kinetic Methods (GKM) for flow simulation



- Application of viscoelastic and poroelastic materials for noise and vibration control
- Loop heat-pipes for thermal control
- Magnetic radiation absorbing materials
- Alternative aviation fuels.

