Universidade do Minho
Escola de Engenharia

Métodos Quantitativos e Qualitativos na Engenharia (M2QE)

Quantitative and Qualitative Methods in Engineering (QQME)

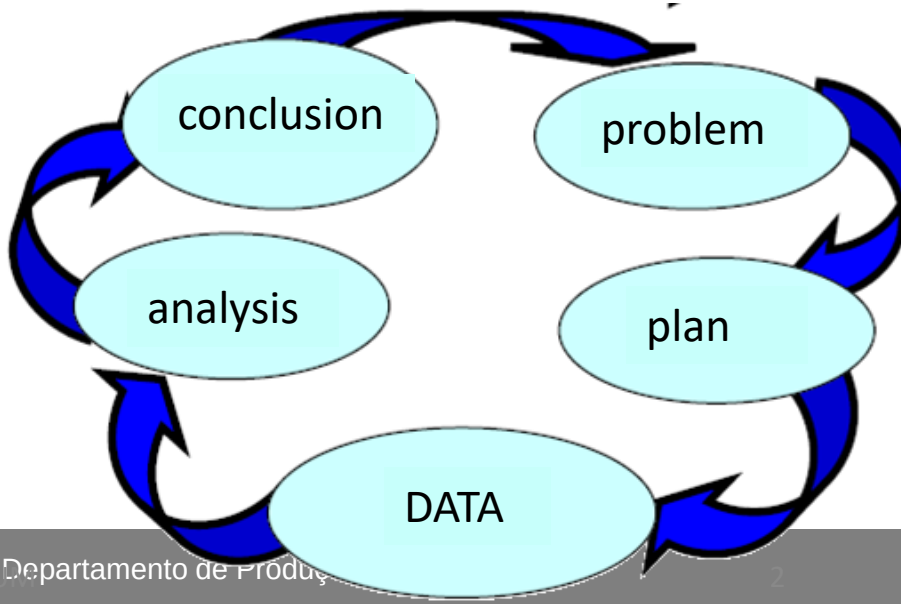
Guimarães, 26 de setembro 2018 | 26 September 2018

Escola de Engenharia, Campus de Azurém | School of Engineering University of Minho

Objective

To give the students the opportunity to advance their knowledge and technical skills in their research to plan, implement, analyze and decide.

The approach of this curricular unit focuses on the procedures and techniques applied to research in Engineering.



Why...

"Statistical thinking will one day be as necessary for efficient citizenship as the ability to read and write."
H. G. Wells (English writer,) 1895.

We could say that statistics helps us to understand the variability of systems by data acquisition, analysis, and implementation of a solution in the context of decision-making processes.

Learning outcomes

- To identify quantitative and qualitative data in the context of Engineering;
- To identify types of quantitative and qualitative research;
- To know the advantages and disadvantages of quantitative and qualitative methods;
- To decide the suitability of different methods;
- To know and use computer tools to support the analysis;
- To present and write the research results.

Syllabus

Block 1
- Block for homogenization of knowledge in statistics and statistical inference

Block 2
- Techniques of design of experiments

Block 3
- Techniques of causality

Block 4
- Techniques for analyzing qualitative data

Block 1: Block for homogenization of knowledge in statistics and statistical inference

- Basic statistical concepts
- Types of information and data sources
- Collection of primary data and secondary data (questionnaires, statistics INE)
- Presentation of data and results
- Definition of hypotheses, types of errors and estimation
- Using SPSS

Block 2: Techniques of design of experiments

- Components and principles of experimental design
- Experiments with one factor
- Introduction to factorial design
- Techniques for parametric and non-parametric analysis
- Using SPSS in data analysis

Block 3: Techniques of causality

- Statistical causality: Some historical considerations
- The language of potential outcomes. Correlation vs regression
- Techniques of analysis of cause-effect for quantitative and qualitative variables
- Using SPSS in data analysis

Block 4: Techniques for analyzing qualitative data

- Framework for Qualitative Data Analysis. Relationship between qualitative and quantitative methods, limits of each approach and practical considerations
- Collection of qualitative data. Objectives and data collection techniques (case studies, interviews (unstructured, semi-structured, structured), questionnaires, life history, focus groups, projective techniques and participant observation)
- Techniques of qualitative analysis, data categorization and building typologies
- Introduction to the use of software in the analysis of qualitative data

Methodology

- TEACHING:

  Expository and active (active learning).

  Participative exposure, group dynamics, self-assessment exercises and discussions among the participants, with the use of the statistical techniques and software.

- EVALUATION:

  Individual/Group dynamics in the classroom (presentation and discussion of scientific papers/proposed problems in class);

  Written Report (work group); Individual oral presentation.

Timetable

Only in the 2nd semester

Thursday: from ….to…

Room: **Lab (DPS)** - Engineering School Building 16 - 2nd Floor

Teaching Team

Block1, Block 2

Lino Costa
MSc in Informatics
PhD in Numerical Methods and Statistics
Research in optimization and applied statistics
lac@dps.uminho.pt

Block 3

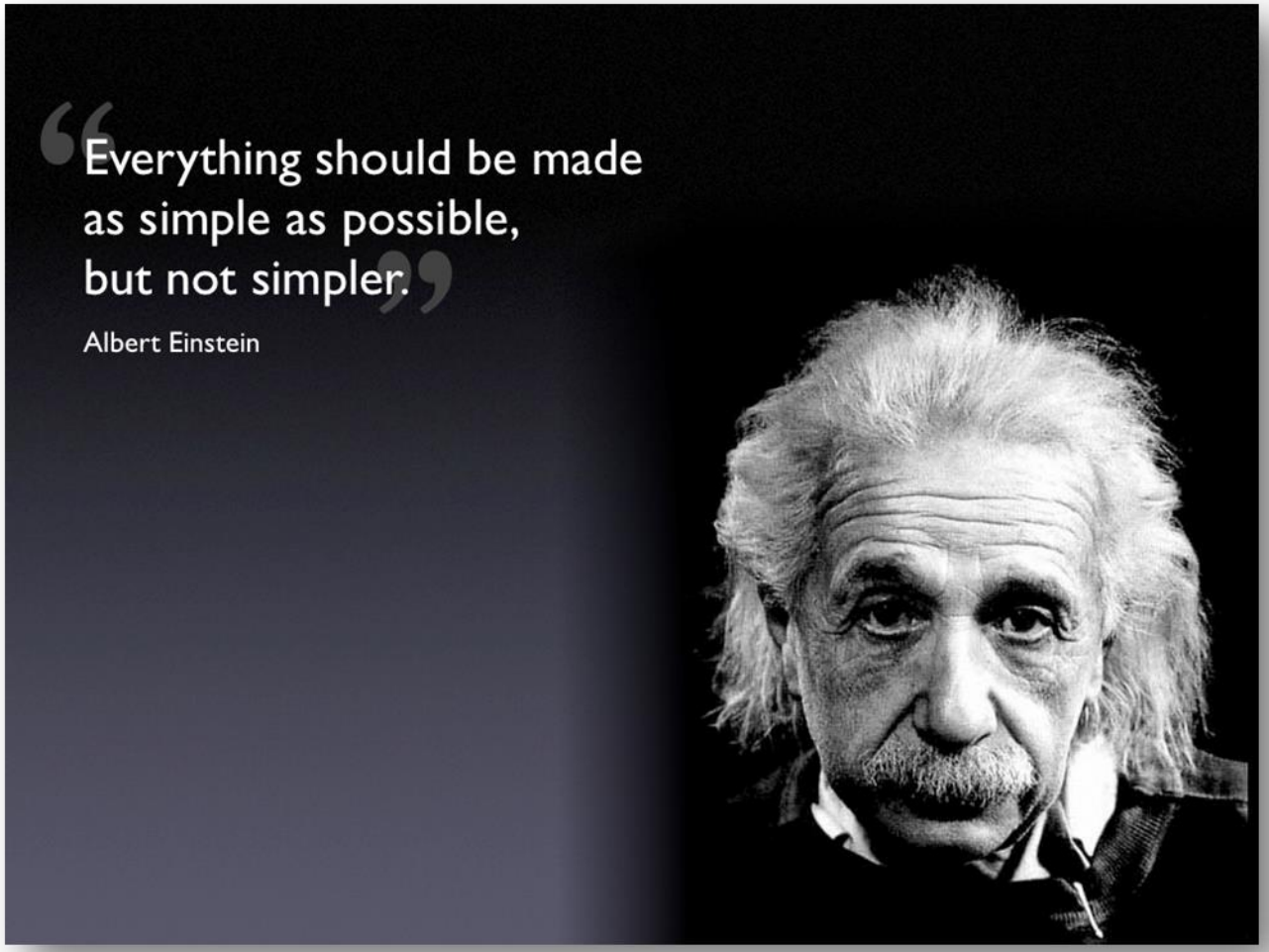
Ana Cristina Braga (R)
MSc in Probability and Statistics
PhD in Applied Statistics
Research in biostatistics, bioinformatics and applied statistics
acb@dps.uminho.pt

Block 4

Celina Pinto Leão
MSc in Industrial Mathematics
PhD in Engineering Science
Current research interests: statistical techniques in engineering; new methodologies in learning process of numerical methods and statistics in engineering
cpl@dps.uminho.pt

With the objective that…

and...


Everything should be made as simple as possible, but not simpler.
Albert Einstein

Plataform

Is available in the **http://moodle.dps.uminho.pt** platform the information of curricular unit

The enrollment key is: **mqqe_2019**

Note: This key is only for students to have access to curricular unit, and not to moodle platform. For this, you must make a register and after, when access for the first time to the curricular unit, this key will be requested (only on the 1st time).

Calendário Escolar e de E... | Moodle@DPS Universida...

moodle.dps.uminho.pt

Pesquisa

Mais acedidos | ResearcherID.com | Contas do Google | Google | Normal Distribution ... | Pessoa já identificada | H G Wells: O pensame... | Booking.com: Locarno...

moodle

Utilizador não identificado. (Entrar)

Português - Portugal (pt)

Moodle do DPS

Menu principal

- DPS
- LEGI
- Notícias

Grupos de disciplinas

- Ano Letivo 2016/2017
- Ano Letivo 2015/2016

Todas as disciplinas ...

Entrar

Nome de utilizador acb

Senha

Entrar

Criar uma conta de utilizador!
recuperar senha

Secretaria de Azurém:

Universidade do Minho
Escola de Engenharia
Departamento de Produção e Sistemas

Campus de Azurém
4800-058 Guimarães
Tel: +351-253-510340/1
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Departamento de Produção e Sistemas

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4710-057 Braga
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Fax: +351-253-604741

Grupos de disciplinas

Utilizadores activos

(nos últimos 5 minutos)
Ana Cristina Braga

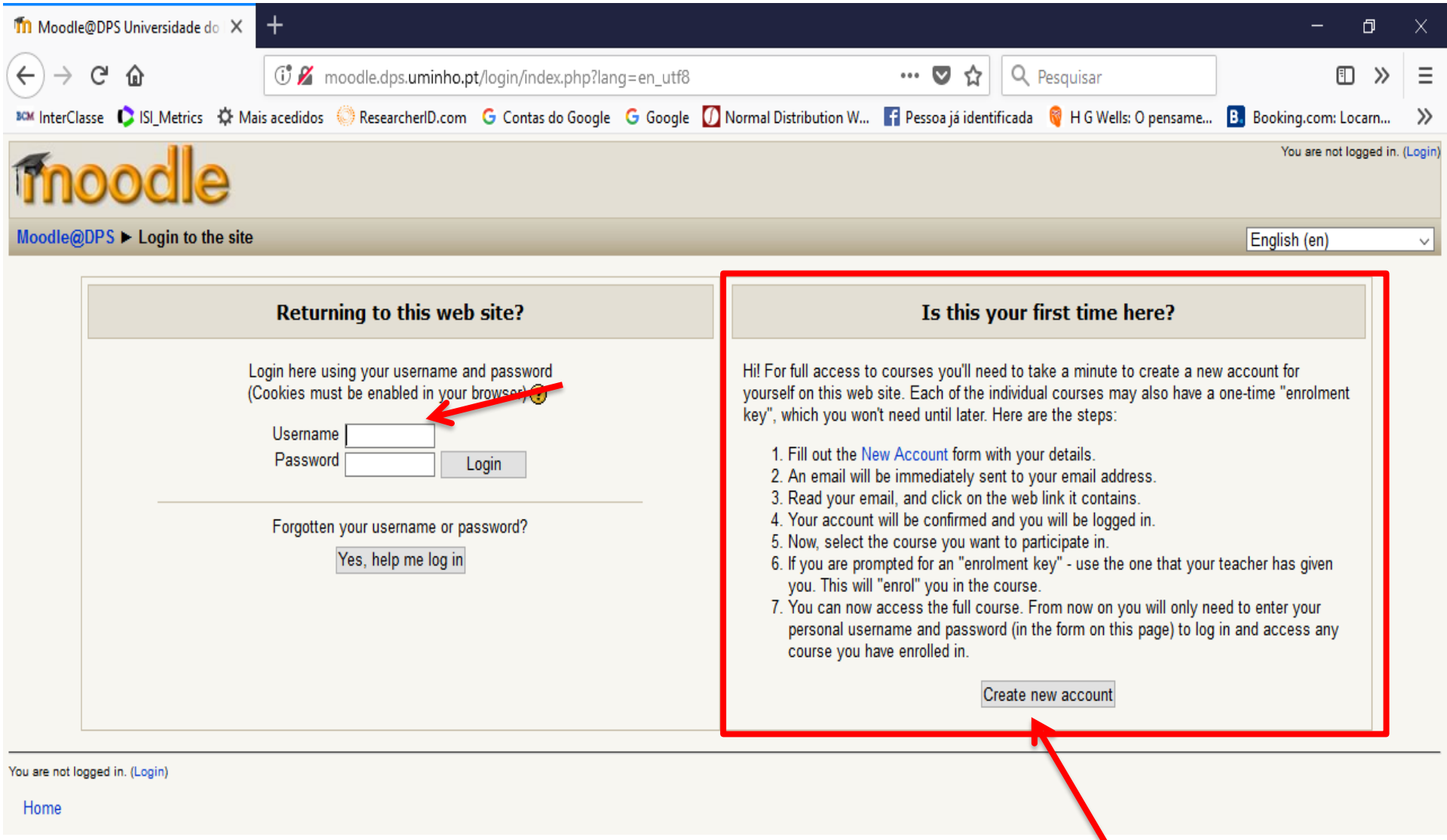
Calendário

◄ February 2017 ►

Dom	Seg	Ter	Qua	Qui	Sex	Sab
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

Live Stats

Total users:	9062
Total courses:	16
Logins today:	1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Pesquisar
InterClasse
ISI_Metrics
Mais acedidos
ResearcherID.com
Contas do Google
Google
Normal Distribution W...
Pessoa já identificada
H G Wells: O pensame...
Booking.com: Locarn...
You are not logged in. (Login)
moodle
Moodle@DPS ▶ Login to the site
English (en)
Returning to this web site?
Login here using your username and password
(Cookies must be enabled in your browser)
Username
Password
Login
Forgotten your username or password?
Yes, help me log in
Is this your first time here?
Hi! For full access to courses you'll need to take a minute to create a new account for yourself on this web site. Each of the individual courses may also have a one-time "enrolment key", which you won't need until later. Here are the steps:
1. Fill out the New Account form with your details.
2. An email will be immediately sent to your email address.
3. Read your email, and click on the web link it contains.
4. Your account will be confirmed and you will be logged in.
5. Now, select the course you want to participate in.
6. If you are prompted for an "enrolment key" - use the one that your teacher has given you. This will "enrol" you in the course.
7. You can now access the full course. From now on you will only need to enter your personal username and password (in the form on this page) to log in and access any course you have enrolled in.
Create new account
You are not logged in. (Login)
Home

1st time

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