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## ROLE OF APPLIED STATISTICS IN THE TEACHING OF QUALITY

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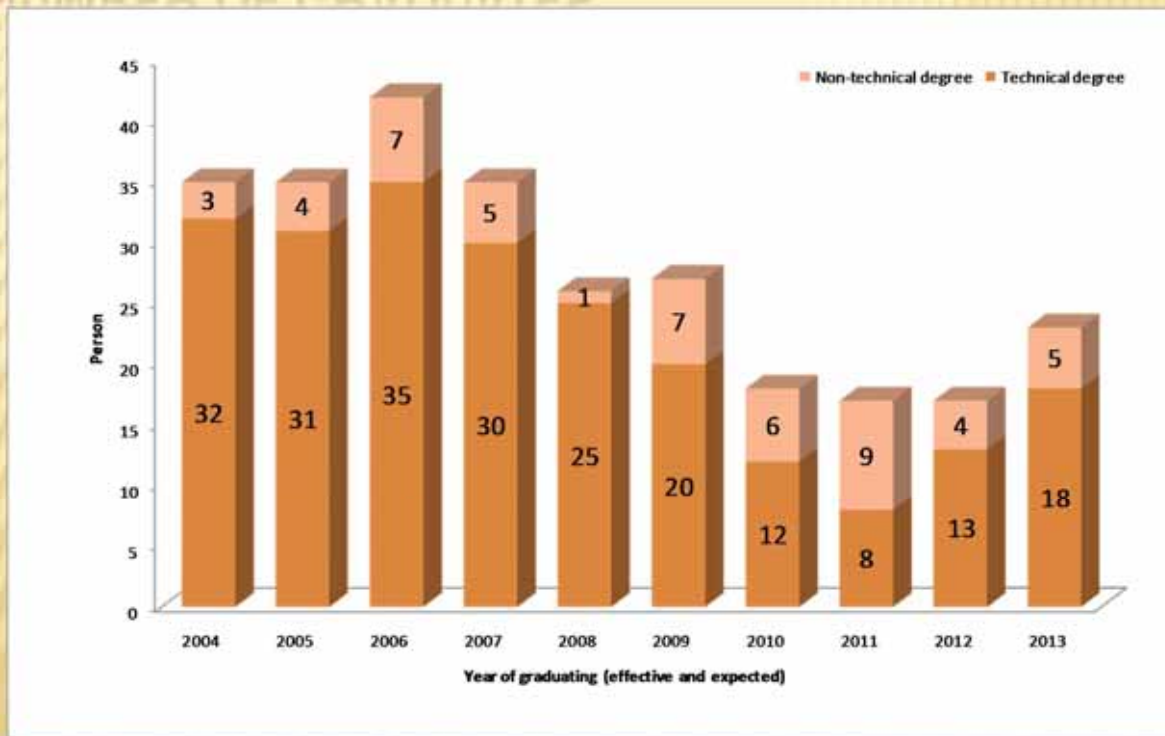
## QUALITY ENGINEER/SPECIALIST POSTGRADUATE COURSE AT ÓBUDA UNIVERSITY

### QUALITY ENGINEER / SPECIALIST POSTGRADUATE COURSE AT ÓBUDA UNIVERSITY CHRONOLOGY

- 1993 Permission to starting Quality Engineer/Specialist education at Bánki Donát Mechanical Engineering College  
120 hours/semester; 4 semesters long
- 1996 The first class starts
- 1999 EOQ Quality System Manager
- 2003 EOQ Quality Assistant, EOQ Quality Operator (intermediate level)
- 2006 EOQ TQM Manager



## POSTGRADUATE COURSE NUMBER OF GRADUATES



## SUBJECTS OF CURRICULUM

Subject	Methods	Lessons/ Semester	Ratio of statistics
Mathematical statistics	Descriptive statistics, probes, distributions	30 lessons /2 sem.	100%
Quality terminology	-	10 lessons /1 sem.	0%
Standardization and legal knowledge	-	22 lessons /2 sem.	0%
Quality level		16 lessons / 1 sem.	56%
Reliability		16 lessons /1 sem.	50%
Cost- and life cycle analysis		16 lessons / 1 sem.	13%
Marketable product development	REM, FMEA, QFD, HACCP	30 lessons / 3 sem.	20%
Informatics	Excel, Statistical softwares	34 lessons /2 sem.	60%

# SUBJECTS OF CURRICULUM

Subject	Methods	Lessons/ Semester	Ratio of statistics
Design of Experiments	DOE	18 lessons /1 sem.	100%
Process improvement and development	Customer satisfaction, 7 basic tools of quality	78 lessons /4 sem.	30%
Statistical quality control	Control charts, Capability analysis	58 lessons / 3 sem.	100 %
Control techniques	MSA, Acceptance sampling	40 lessons / 2 sem.	80%
Manufacturing tools		34 lessons / 2 sem.	25-75%
Quality management		78 lessons /4 sem.	0%
Summary	480 lessons /4 semesters		46,5%/ 223 lessons

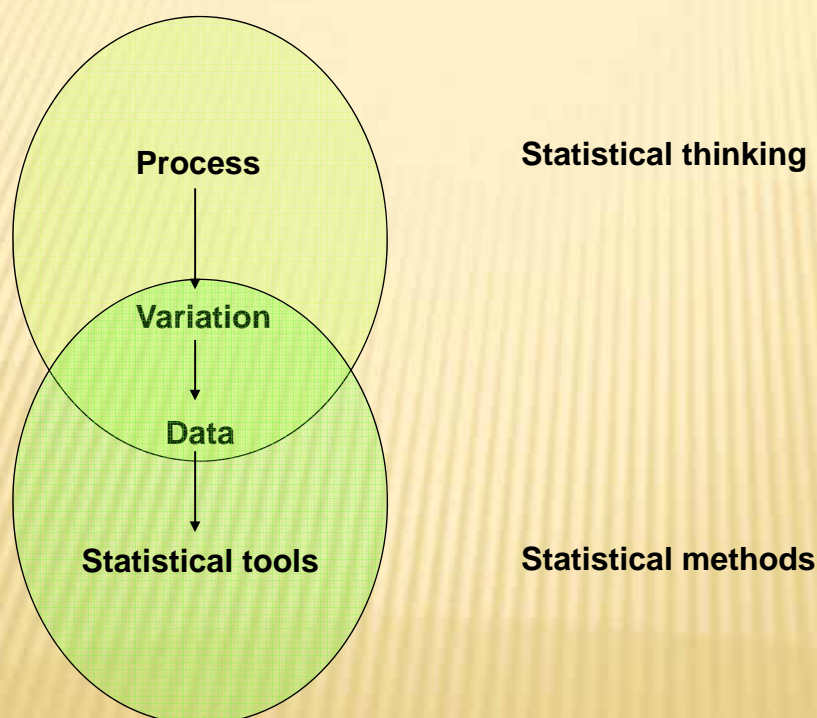
## THE ROLE OF STATISTICAL THINKING IN QUALITY MANAGEMENT

# IMPORTANCE OF STATISTICAL THINKING

Statistical thinking is a philosophy of learning and action based on the following fundamental principles:

- + All work occurs in a system of interconnected processes
- + Variation exists in all processes
- + Understanding and reducing variation keys to success

## CONNECTION BETWEEN STATISTICAL THINKING AND METHODS



# STATISTICAL THINKING AND METHODS

Principle	Methods
All work occurs in a system of interconnected processes	Ishikawa diagram, FMEA, QFD
Variation exists in all processes	Descriptive statistics, MSA, Capability analysis
Understanding and reducing variation keys to success	ANOVA, Regression analysis, Control charts, DOE, Pareto charts

## USE OF STATISTICAL THINKING

DEPENDS ON LEVELS OF ACTIVITY AND JOB RESPONSIBILITY



## EXAMPLES OF STATISTICAL THINKING STRATEGIC ZONE

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- ✘ Devising Measures of Success in Value Adding Areas
- ✘ Advising on feasible target values
- ✘ Survey design, data collection, modelling and analysis
- ✘ Developing appropriate formats for presenting reports on Key Performance Indicators
- ✘ Experimentation is encouraged

## EXAMPLES OF STATISTICAL THINKING MANAGERIAL ZONE

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- ✘ Process variation is considered when setting goals
- ✘ Both project process and results are reviewed
- ✘ Educating Board and top management about
  - + WHAT information they should receive
  - + HOW it should be interpreted
  - + WHEN to act
  - + WHAT action to take

## EXAMPLES OF STATISTICAL THINKING OPERATIONAL ZONE

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- ✘ Traditionally statisticians have contributed most
  - + quantification of uncertainty
  - + Knowledge of variation and data
  - + disciplined and efficient pursuit of process control and improvement
- ✘ Work processes are flowcharted and documented
- ✘ Key measurements are identified (time plots displayed)

TEACHING EXPERIENCE CONCERNING APPLIED  
STATISTICS



## DIFFICULTIES IN TEACHING QUALITY STATISTICS

- ✘ Students from different workplaces (e.g. from manufacturing, education, laboratory, administration, pharmaceutical industry)
- ✘ Students with different fields of interest
- ✘ Students with different qualifications

## TEACHING PRACTICE AT ÓBUDA UNIVERSITY



## TEACHING PRACTICE AT ÓBUDA UNIVERSITY

- ✘ online measurements
- ✘ statistical software packages
- ✘ series parts
- ✘ easy to use measurement tools (digital caliper, micrometer, dial)

**THANK YOU FOR YOUR KIND ATTENTION!**