TECHNICAL UNIVERSITY OF CRETE

DEPARTMENT OF PRODUCTION ENGINEERING AND MANAGEMENT

UNDERGRADUATE PROGRAM STUDENT GUIDE

2012-2013

CHANIA 2012
RECTORATE

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Dear Sir / Madame,

The Department of Production Engineering and Management has been created with the purpose of educating engineers with enhanced management knowledge and skills. The PEM Department (DPEM) accepted its first undergraduate students in 1984 and the first graduate students in 1986.

Production and Management Engineers, internationally known as Industrial Engineers as well, deal with design, optimization and management of complex engineering systems. Our graduates have found their way and build carriers in industry as well as service and consulting companies.

Our Department offers a five-year undergraduate program leading to a diploma, as well as three graduate study programs in the following directions: Management, Operational Research and Production Systems, that lead to Master of Science and Doctorate Degrees. Undergraduate studies are done exclusively in Greek language, with the exception of Erasmus exchange students who have the option to follow courses and seminars in English and other languages.

Updated information about our Department can be found in the web page www.dpem.tuc.gr.

On behalf of my Colleagues and the co-workers of the Department I would like to welcome you to our Department and kindly ask you to contact us for further information or proposals for changes.

With kind regards

Professor Georgios E. Stavroulakis

Head of the Department
# Table of Contents

1. **General Information** .......................................................................................................................... 8  
   1.1 Mission .................................................................................................................................................. 8  
   1.2 Personnel ............................................................................................................................................... 8  
   1.3 Departmental Administrative Structure ............................................................................................... 9  
   1.4 Departmental Divisions ....................................................................................................................... 9  
      1.4.1 Division of Production Systems ...................................................................................................... 10  
         Faculty Members ................................................................................................................................... 10  
         Division Laboratories ........................................................................................................................... 11  
      1.4.2 Division of Decision Sciences ........................................................................................................ 12  
         Faculty Members .................................................................................................................................. 12  
         Division Laboratories ......................................................................................................................... 13  
      1.4.3 Division of Management ................................................................................................................ 13  
         Faculty Members ............................................................................................................................... 13  
         Division Laboratories .......................................................................................................................... 14  
      1.4.4 Inter-departmental Laboratories .................................................................................................... 15  
   1.5 Honorary Doctorates ............................................................................................................................ 15  
2. **Undergraduate Studies Structure and Rules** .................................................................................. 16  
   2.1 Structure ............................................................................................................................................... 16  
   2.2 Program Compilation ............................................................................................................................ 16  
   2.3 Academic Year and Semester Duration ............................................................................................... 16  
   2.4 Course Selection ..................................................................................................................................... 17  
   2.5 Class attendance – Grading .................................................................................................................. 17  
   2.6 Diploma Thesis ....................................................................................................................................... 18  
   2.7 Degree Requirements ........................................................................................................................... 19  
3. **Undergraduate Curriculum** ............................................................................................................... 20  
   1st Semester ............................................................................................................................................... 20  
   2nd Semester .............................................................................................................................................. 20  
   3rd Semester ............................................................................................................................................... 20  
   4th Semester ............................................................................................................................................... 21  
   5th Semester ............................................................................................................................................... 21  
   6th Semester ............................................................................................................................................... 21  
   7th Semester ............................................................................................................................................... 22  
   8th Semester ............................................................................................................................................... 22  
   9th Semester ............................................................................................................................................... 23  
   10th Semester ............................................................................................................................................ 23  
4. **Course Descriptions** .......................................................................................................................... 25
1. General Information

1.1 Mission

Education at the Department of Production Engineering and Management (DPEM) aims at the culmination of necessary skills and capabilities for the development, design and optimization of production systems. The first students were admitted in September 1984, with the then newly-established department being the first in Greece to specifically embrace this subject area.

The establishment of the department was necessitated by the following societal and economic developments:

- To maintain competitiveness at a national and international level, there is a need for effective implementation of methodologies to enhance productivity and improve production of goods and services.
- To ensure rapid adoption of innovation and new technologies and assess their potential impact on everyday life and the environment, a holistic educational approach is required that encompasses technological, economical, social and ecological aspects of production.
- To fulfill the requirement of Greek corporations for highly educated and skilled engineers that can deal successfully and efficiently not only with pure technological/engineering problems but also with their managerial and organizational facets.

The undergraduate curriculum of the DPEM comprises courses in mathematics, physics, humanities, production systems, operational research, information systems, applied economics, finance and management sciences. Students of the department have the opportunity to attend courses in universities across Europe via student exchange programs.

Graduates of the department have been successfully employed in the manufacturing and service fields. Indicative fields of employment are:

- Production systems design and management;
- Information systems design, development and management;
- E-commerce applications development;
- Computer-aided product design and rapid product design;
- Material requirements planning;
- Logistics;
- Dynamic resource allocation;
- Robotics;
- Project management;
- Occupational Safety;
- Transportation Systems;
- Quality management;
- Financial decision and investment planning;
- Financial engineering and financial risk management;
- Artificial intelligence;
- Data mining and intelligent systems;
- Decision support systems;
- Environmental studies;
- Consumer behavior studies and technological marketing;
- Operational research and multi-criteria decision making.

1.2 Personnel

The personnel of the department is divided into the following categories:

1. Faculty members. Faculty members have a Ph.D. and are appointed at the following ranks: Professor, Associate Professor, Assistant Professor and Lecturer.
2. Adjunct Professors. In addition to regular faculty members the department hires adjunct professors to support the undergraduate curriculum.

3. Special Laboratory-Teaching Personnel (SLTP). SLTP members provide instruction services at the departmental laboratories.

4. Special Technical Laboratory Personnel (STLP). The STLP members provide technical support services.

5. Administrative staff. Administrative staff provides administrative services essential to the educational and research objectives of the department.

1.3 Departmental Administrative Structure

The Head of the Department bears the administrative and financial responsibilities of the department. The General Assembly, chaired by the Head of the Department, is the main administrative instrument of the Department. The General Assembly comprises faculty members, as well as, representatives of: graduate and undergraduate students, SLTP and STLP.

Professor Georgios Stavroulakis serves as the Head of the Department and professor Anastasios Pouliezos serves as the Associate Head. Mrs. Dimitra Havre, oversees administrative support to the Department.

The General Assembly receives recommendations from the following committees:

A. Practical Training Committee  
I. Nikolos, Assistant Professor.

B. Undergraduate Studies Committee and Undergraduate Student Advisor  
Y. Marinakis, Lecturer.

C. Graduate Studies Committee  
M. Doumpos, Assistant Professor,  
D. Rovas, Assistant Professor,  
A. Doulamis, Assistant Professor.

D. Standardization Committee  
A. Doulamis, Assistant Professor.

E. Professional Rights Committee  
E. Grigoroudis, Assistant Professor.

F. Public Relations Committee  
D. Rovas, Assistant Professor.

G. ERASMUS Departmental Coordinator  
F. Passiouras, Assistant Professor.

H. Library Committee (Campus-level)  
I. Nikolos, Assistant Professor.

I. Information Technology Services Committee (Campus-level)  
A. Doulamis, Assistant Professor.

J. Student Records  
E. Grigoroudis, Assistant Professor.  
Y. Marinakis, Lecturer.

K. Strategic Design Committee  
N. Matsatsinis, Professor,  
N. Bilalis, Professor,  
M. Papageorgiou, Professor,  
N. Tsourveloudis, Professor.

1.4 Departmental Divisions

The Department of Production Engineering and Management is organized into three divisions, each of them including a number of interrelated scientific fields. The Departmental divisions are:

**Production Systems**

**Decision Sciences**

**Management**
1.4.1. Division of Production Systems

The division of production systems is involved with the various aspects of the theory of production systems (systems reliability, task scheduling, analysis and optimization of production systems, power systems, etc.) as well as modern manufacturing and production technology (flexible manufacturing systems, robotics, automatic control, computer-aided design, computer-aided manufacturing, material handling, environmental technology, etc.).

Faculty Members

Antoniadis, Aristomenis
Associate Professor
Ph.D. (1989), Department of Mechanical Engineering, Aristotle University of Thessaloniki, Greece.
Diploma (1984), Department of Mechanical Engineering, Aristotle University of Thessaloniki, Greece.
Research Area: Production Systems.

Bilalis, Nikolaos
Professor
Ph.D. (1983), Department of Production Engineering, Loughborough University of Technology, United Kingdom.
M.Sc. (1979), Department of Mechanical Engineering, Aston University of Birmingham, United Kingdom.
Diploma (1978), Department of Mechanical and Electrical Engineering, National Technical University of Athens, Greece.
Research Area: Computer-Aided Design and Manufacturing.

Ioannidis, Efstratios
Assistant Professor
Ph.D. (2004), Department of Production Engineering and Management, Technical University of Crete, Greece.
M.Sc. (1997), Department of Production Engineering and Management, Technical University of Crete, Greece.
Diploma (1995), Department of Production Engineering and Management, Technical University of Crete, Greece.
Research Area: Analysis and optimization of production lines and networks.

Kanellos, Fotios
Lecturer
Ph.D. (2003), Department of Electrical and Computer Engineering, National Technical University of Athens, Greece.
M.Sc. (2001), Department of Electrical and Computer Engineering, National Technical University of Athens, Greece.
Diploma (1998), Department of Electrical and Computer Engineering, National Technical University of Athens, Greece.
Research Area: Electric Networks.

Kouikoglou, Vassilis
Professor
Ph.D. (1989), Department of Production Engineering and Management, Technical University of Crete, Greece.
Diploma (1985), Department of Electrical and Computer Engineering, National Technical University of Athens, Greece.
Research Area: Production Networks.
Nikolos, Ioannis  
Assistant Professor
Ph.D. (1996), Department of Mechanical Engineering, National Technical University of Athens, Greece.  
Diploma (1990), Department of Mechanical Engineering, National Technical University of Athens, Greece.  
Research Area: Thermal and Hydrodynamic Machines.

Papaeftimiou, Spyros  
Assistant Professor
Ph.D. (2001), Department of Physics, University of Patras, Greece.  
M.Sc. (1997), Department of Physics, University of Patras, Greece.  
B.Sc. (1995), Department of Physics, University of Patras, Greece.  

Phillis, Yannis  
Professor
Ph.D. (1980), Department of Engineering Systems, University of California, Los Angeles, United States of America.  
M.Sc. (1978), Department of Engineering Systems, University of California, Los Angeles, United States of America.  
Diploma (1973), Department of Mechanical and Electrical Engineering, National Technical University of Athens, Greece.  
Research Area: Production and Environmental Systems.

Pouliezos, Anastasios  
Professor
Ph.D. (1980), Department of Electrical Engineering, Brunel University of London, United Kingdom.  
M.Sc. (1976), Department of Computing and Control, Imperial College of London, United Kingdom.  
B.Sc. (1975), Mathematics and Computing, Polytechnic of North London, United Kingdom.  
Research Area: Control Systems.

Rovas, Dimitrios  
Assistant Professor
Ph.D. (2003), Department of Mechanical Engineering, Massachusetts Institute of Technology, United States of America.  
Diploma (1998), Department of Mechanical Engineering, National Technical University of Athens, Greece.  
Research Area: Thermodynamics and Heat Transfer, Computational Science and Engineering.

Tsourveloudis, Nikolaos  
Professor
Ph.D. (1995), Department of Production Engineering and Management, Technical University of Crete, Greece.  
Diploma (1990), Department of Production Engineering and Management, Technical University of Crete, Greece.  
Research Area: Manufacturing Technology.

**Division Laboratories**

Computer-Aided Manufacturing (CAM)  
Y. Phillis (Director)
Educational and research activities of the laboratory focus on flexible manufacturing systems, production technology, computer-aided manufacturing, and environmental systems.

Industrial Systems Control Laboratory  
A. Pouliezos (Director)
Educational and research activities of the laboratory focus on automatic control, fault diagnosis as well as unmanned vehicles and robots, and artificial intelligence. It is also involved in intelligent systems using neural networks, fuzzy-logic, etc for fault-diagnosis in industrial systems as well as learning control systems.
Computer-Aided Design
N. Bilalis (Director)
Educational and research activities of the laboratory focus on computer-aided product design and development, rapid product development, virtual prototyping and manufacturing, innovation management, design for disassembly, product modeling.

Intelligent Systems and Robotics Laboratory
N. Tsourveloudis (Director)
Educational and research activities of the laboratory focus on robotic systems, kinematics, sensors, unmanned robots and vehicles, autonomous navigation systems and simulation of robotic systems.

Micromachining and manufacturing modeling Laboratory
A. Antoniadis (Director)
Micromachining and Manufacturing Modeling Lab (m3) was created in 2010 in order to cover the educational and research needs in advanced manufacturing fields, and micromachining in particular. In addition, the m3 supports manufacturing subjects of mechanical engineers in general, such as Machine Elements. The m3 provides high scientific knowledge to our students, while being actively involved in research collaborations with other Universities and Research Institutions and promoting collaborations with enterprises for the resolution of practical problems. The research fields where m3 is actively involved or provides services via the Special Research Fund Account (ELKE) of the Technical University of Crete are: Microtechnologies, CAD/CAM/CAE, 3D Modeling, Finite Elements Method Analysis for Production Technologies, Reverse Engineering and specialised subjects of Bioengineering and Nanotechnology.

1.4.2. Division of Decision Sciences
The division of decision sciences specializes in methodologies and techniques aiming at supporting decision making as well as at the design, control and optimization of production systems, telematic applications and service provision.

Faculty Members

Doumpos, Michalis
Assistant Professor
Ph.D. (2000), Department of Production Engineering and Management, Technical University of Crete, Greece.
M.Sc. (1997), Department of Production Engineering and Management, Technical University of Crete, Greece.
Diploma (1995), Department of Production Engineering and Management, Technical University of Crete, Greece.

Marinakis, Yannis
Lecturer
Ph.D. (2005), Department of Production Engineering and Management, Technical University of Crete, Greece.
M.Sc. (2001), Department of Production Engineering and Management, Technical University of Crete, Greece.
Diploma (1999), Department of Production Engineering and Management, Technical University of Crete, Greece.
Research Area: Stochastic Optimization and Applications.

Papageorgiou, Markos
Professor
Dr.-Ing. (1981), Department of Electrical Engineering, Technical University of Munich, Germany.
Dipl.-Ing. (1976), Department of Electrical Engineering, Technical University of Munich, Germany.
Research Area: Optimization, Automatic Control, Applications.
Papamichail, Ioannis
Assistant Professor
Ph.D. (2002), Department of Chemical Engineering and Chemical Technology, Imperial College London, United Kingdom.
M.Sc. (1999), Process Systems Engineering, Imperial College London, United Kingdom.
Diploma (1998), Department of Chemical Engineering, National Technical University of Athens, Greece.
Research Area: Mathematical Programming and Algorithms.

Stavroulakis, Georgios
Professor
Ph.D. (1991), Department of Civil Engineering, Aristotle University of Thessaloniki, Greece.
Diploma (1985), Department of Civil Engineering, Aristotle University of Thessaloniki, Greece.
Habilitation (2000), Department of Civil Engineering, Carolo-Wilhelmina Technical University, Braunschweig, Germany.
Research Area: Non-smooth mechanics and optimization.

Division Laboratories

Dynamic Systems and Simulation
M. Papageorgiou (Director)
Educational and research activities of the laboratory focus on modeling, simulation, automatic control and optimization with practical applications to transportation and traffic systems, water systems, production systems, etc.

Decision Support Systems
N. Matsatsinis (Director)
Educational and research activities of the laboratory focus on methodological research dealing with the development and/or improvement of decision-making methods and techniques as well as real-world studies on systems evaluation and decision support, operations research, multi-criteria analysis, multi-agent systems as well as logistics.

Computational Mechanics and Optimization
G. Stavroulakis (Director)
The Institute of Computational Mechanics and Optimization works on the theory and development of methods related to computational mechanics and optimization for materials and structures. Research efforts are focused on non-smooth and non-convex problems in mechanics and optimization.

1.4.3. Division of Management

The division of management covers a wide area of management and finance sciences including, among others, financial analysis & engineering, marketing, ergonomics, safety of work, information systems, e-commerce, artificial intelligence, quality control, etc.

Faculty Members

Doulamis, Anastasios
Assistant Professor
Ph.D. (2001), Department of Electrical and Computer Engineering, National Technical University of Athens, Greece.
Diploma (1995), Department of Electrical and Computer Engineering, National Technical University of Athens, Greece.
Research Area: Intelligent Methods and Database Analysis Systems.
Grigoroudis, Evangelos  
Assistant Professor  
Ph.D. (1999), Department of Production Engineering and Management, Technical University of Crete, Greece.  
Diploma (1991), Department of Production Engineering and Management, Technical University of Crete, Greece.  

Kontogiannis, Tom  
Associate Professor  
Ph.D. (1989), Department of Mechanical Engineering, Loughborough University of Technology, United Kingdom.  
M.Sc. (1986), Department of Mechanical Engineering, University College London, United Kingdom.  
Diploma (1983), Department of Mechanical Engineering, Aristotle University of Thessaloniki, Greece.  
Research Area: Ergonomics.

Matsatsinis, Nikolaos  
Professor  
Ph.D. (1995), Department of Production Engineering and Management, Technical University of Crete, Greece.  
B.Sc. (1980), Department of Physics, Aristotle University of Thessaloniki, Greece.  
Research Area: Information Systems.

Moustakis, Vassilis  
Professor  
Diploma (1978), Department of Mechanical and Aeronautical Engineering, University of Patras, Greece.  
Research Area: Operations Management, Data Mining.

Pasiouras, Fotis  
Assistant Professor  
Ph.D. (2005), Business School, University of Coventry, United Kingdom.  
MBA (2001), Master in Business Administration in Finance, University of Coventry, United Kingdom.  
B.Sc. (2000), Department Economics, Aristotle University of Thessaloniki, Greece.  
Research Area: Quantitative Methods in Banking and Business Administration.

Zopounidis, Constantin  
Professor  
B.Sc. (1981), Department of Business Administration, University of Macedonia, Greece.  

Division Laboratories

Data Analysis and Forecasting  
Educational and research activities of the laboratory focus on data analysis, forecasting, marketing and quality control systems.
1.4.4. **Inter-departmental Laboratories**

The following interdepartmental laboratory also provides educational and research services to the Department:

- **Machine Tools Laboratory**
  - N. Tsourveloudis (Director)
  - The laboratory is involved in educational and research activities in machine tools, manufacturing technology material processing, welding, drilling and milling.

- **Language Research and Resource Center**
  - G. Pouliidakis (Director)
  - The Language Center at the Technical University of Crete, established in September 1997, offers a variety of autonomous language learning resources to its engineering students. Besides servicing undergraduate students in the Departments of Production Engineering and Management, Electronic and Computer Engineering, Mineral Resources Engineering, and Environmental Engineering, the Language Center offers resources to all students who are interested in developing language skills.

1.5 **Honorary Doctorates**

The following honorary doctorates have been awarded by the Department in chronological order:

1. 5 May 1993, **Rudolf Kalman** for contributions to the field of automatic control;
2. 3 May 1996, **Sir David Cox** for contributions to the field of statistics;
3. 10 June 2002, **Bernard Roy** for contributions to the field of decision support systems and multicriteria analysis;
4. 15 December 2004, **Mohammad Jamshidi** for contributions to the field of automatic control;
5. 1 September 2008, **Pravin Varaiya** for contributions to the field of automatic control and applications to production, communication and transportation systems;
6. 10 November 2008, **Roman Słowiński** for contributions to the fields of decision support systems, rough sets and soft computing;
7. 29 May 2009, **Dimitri Bertsekas** for contributions to the field of optimization and operational research.
2. Undergraduate Studies
Structure and Rules

2.1 Structure
The academic year starts each year on September 1st and ends on August 31st of the following year. Each academic year has two semesters: the fall and the spring semester. Each course has a duration of one semester, is offered either in the spring or fall semester, and includes:

- lectures,
- tutorials,
- laboratory exercises,
- seminars (given by industry experts), and
- visits to production plants and companies.

The undergraduate program has a total duration of ten semesters, with the first nine semesters devoted to coursework and the final semester to a diploma thesis. Course offerings are grouped into two categories: (a) core courses, and (b) electives; successful completion of all required courses is one of the prerequisites for an undergraduate degree. Students should also successfully complete a specific number of elective courses.

2.2 Program Compilation
The detailed curriculum to be adopted for the next academic year is finalized at the end of each spring semester. The detailed curriculum provides the following information for each of the courses to be offered:

- title of course;
- number of lecture hours per week;
- number of tutorial hours per week;
- number of laboratory-exercise hours per week;
- credit units.

In Section 3 of this document, the detailed curriculum for the academic year 2009-2010 is presented. To aid students with course selection, a study path is also provided giving recommendations for course selection per semester. To ensure successful completion in the allotted time, to account for interdependencies between courses, and to ensure a balanced workload, students are strongly advised to follow the suggested path.

2.3 Academic Year and Semester Duration
Classroom instruction commences on the second half of September and concludes by the end of the spring semester, usually in the first half of June. The exact start and end dates of each semester, as well as the exam periods can be found in the academic calendar, available at the University web site. Each semester lasts 15 weeks: 13 weeks for classroom instruction and 2 weeks for exams. There is a break of one week between the fall and spring semesters. There are no classes on the following holidays:
### Fall Semester
- 28th October (National holiday)
- 17th November
- 21st November (Local holiday)
- Christmas Break (2 weeks)
- 30th January (School holiday)

### Spring Semester
- Lent Monday
- 25th March (National Holiday)
- Easter break (2 weeks)
- 1st May (Labor Day)
- 1 day for student elections (determined by the student body)
- Holy Spirit Monday

### 2.4 Course Selection

Registration for classes takes place during the first two weeks of each semester at the Registrar's Office. Following the suggested study plan, students typically register for 6 or 7 courses per semester to exactly 30 credits – representing a typical workload for a full-time student that corresponds to 22-35 instruction hours per week (tutorials and lab exercises included). Students may register for more than the aforementioned number of courses, a provision necessary for students retaking classes they have not successfully completed in previous semesters. Depending on the semester of attendance certain limits apply regarding the maximum number of courses that a student may register for credit. During the registration period students are allowed to add or drop courses, but no changes are permitted after the registration period expires. Students are not allowed to participate in labs, exams, or take credit for classes they have not registered. Courses in odd-numbered semesters are offered in the fall, and courses in even-numbered semesters are offered in the spring.

### 2.5 Class attendance – Grading

In the beginning of each semester the instructor provides the syllabus with a course description, office hours, grading policy, and course requirements. Topics to be covered have to match closely the approved course contents contained in this student guide. Lecture and tutorial attendance is highly recommended but not mandatory. Students have to successfully complete the course requirements which might include: midterm exams, assignments, projects, laboratories, and the final exam which occurs during the final exam period.

In each academic year there are three examination periods: the first, in January, after the end of the fall semester; the second, in June, after the end of the spring semester; and the third, in September, after the end of the summer break. The exact dates for the exam periods can be found in the academic calendar, and the exam schedule is announced in advance in the department and university web-sites. The winter examination period is for courses offered in the fall semester, whereas the summer examination period is for courses offered in the spring semester. Students that miss or fail the final exam of one or more fall- or spring-semester courses, can retake the final exam in the third examination period (in September). Failure to successfully fulfill the class requirements during the two exam periods, requires students to register and retake the class in the following academic year(s).

The final grade is computed by the class instructor as an overall performance in midterm exams, assignments, projects, laboratory exercises, and the final exam. The grading policy is announced by the instructor at the beginning of each semester. The final grades are announced within a period of fifteen (15) days after the final exam and are given on a scale from zero (0) to ten (10), rounded to the nearest half (½). A grade of five (5) or higher is required for successful completion of the class. Depending on the final grade, class aptitude can be characterized according to the following table:

<table>
<thead>
<tr>
<th>Final Grade</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.50 – 10</td>
<td>Excellent</td>
</tr>
<tr>
<td>6.50 – 8.49</td>
<td>Very Good</td>
</tr>
<tr>
<td>5 – 6.49</td>
<td>Good</td>
</tr>
<tr>
<td>3 – 4</td>
<td>Moderate</td>
</tr>
<tr>
<td>0 – 1 - 2</td>
<td>Poor</td>
</tr>
</tbody>
</table>
2.6 Diploma Thesis

The diploma thesis has a duration of at least one semester. Diploma thesis topics are assigned and supervised by regular and adjunct faculty members in relevant-to-the-department subject areas. Students can start work on their diploma theses in any semester; they cannot however defend their thesis unless they have successfully completed their coursework. Upon completion, students have to take part in an oral examination. Academic performance, the quality of the work and the presentation are evaluated by the examination committee comprising three faculty members. The thesis grade is the average of the grades assigned by the three committee members.
2.7 Degree Requirements

An undergraduate degree is conferred upon successful completion of all the following requirements:

1. Enrollment Residence Requirement:
   Registration in the Department and attendance for at least 10 semesters.

2. Required Coursework Requirement:
   Successful completion (final grade $\geq 5$) of all required courses, for a total of 300 credits.

3. Elective Coursework Requirement:
   Successful completion (final grade $\geq 5$) of a certain number of required electives. Courses are grouped according to their subject areas in seven (7) groups:
   - Group I: Mathematical - Physical Sciences;
   - Group II: Humanities – Foreign Languages;
   - Group III: Electromechanical Systems;
   - Group IV: Information Systems;
   - Group V: Production Systems;
   - Group VI: Operations Research, and;
   - Group VII: Management.
   For each group a number of elective courses are offered. Students should select and successfully complete exactly one (1) course from electives in Group II and at least one (1) course from electives in Group III; one (1) course from electives in Group IV; one (1) course from electives in Group V; one (1) course from electives in Group VI; one (1) course from electives in Group VII.

4. Diploma Thesis Requirement:
   Students should successfully complete and defend their diploma thesis.

A total of 300 credits are required for the undergraduate degree. The coursework Grade Point Average (GPA) is computed as a weighted average of the grades received for each of the courses successfully completed. The weights used are available at the Registrar’s office or the Greek-language version of this guide. The Diploma Grade is computed by adding the course GPA, multiplied by a coefficient of $4/5$, and the diploma thesis grade, multiplied by a coefficient of $1/5$. Overall academic performance is characterized according to the following table:

<table>
<thead>
<tr>
<th>Diploma Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.00 – 6.49</td>
<td>Good</td>
</tr>
<tr>
<td>6.50 – 8.49</td>
<td>Very Good</td>
</tr>
<tr>
<td>8.50 – 10.00</td>
<td>Excellent</td>
</tr>
</tbody>
</table>
3. Undergraduate Curriculum

**1st Semester**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Courses</th>
<th>Lecture</th>
<th>Tutorial</th>
<th>Lab</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 101</td>
<td>Differential and Integral Calculus I</td>
<td>4</td>
<td>1</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>PHYS 101</td>
<td>Physics I</td>
<td>2</td>
<td>1</td>
<td>1.5</td>
<td>4</td>
</tr>
<tr>
<td>DPEM 101</td>
<td>Programming Methodology</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>DPEM 102</td>
<td>Operations Research Methodology</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>MECH 101</td>
<td>Computer-Aided Mechanical Drafting</td>
<td>2</td>
<td>-</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>MATH 201</td>
<td>Linear Algebra</td>
<td>3</td>
<td>1</td>
<td>-</td>
<td>5</td>
</tr>
</tbody>
</table>

**TOTAL**

|                  | 15 | 5   | 6.5 | 30 |

**SEMINARS**

- English I or German I
- Microsoft Office applications
- Basic internet applications

**2nd Semester**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Courses</th>
<th>Lecture</th>
<th>Tutorial</th>
<th>Lab</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 102</td>
<td>Differential and Integral Calculus II</td>
<td>3</td>
<td>1</td>
<td>-</td>
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<tr>
<td>PHYS 102</td>
<td>Physics II</td>
<td>2</td>
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<td>1.5</td>
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<tr>
<td>MECH 102</td>
<td>Engineering Mechanics – Statics</td>
<td>3</td>
<td>-</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>CHEM 103</td>
<td>General Chemistry</td>
<td>2</td>
<td>-</td>
<td>2</td>
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<tr>
<td>DPEM 121</td>
<td>Electric Circuits</td>
<td>3</td>
<td>-</td>
<td>1</td>
<td>5</td>
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<tr>
<td>DPEM 122</td>
<td>Algorithms and Data Structures</td>
<td>2</td>
<td>-</td>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>

**TOTAL**

|                  | 15 | 2   | 8.5 | 30 |

**SEMINARS**

- English II or German II
- MATLAB
- Statistical Software

**3rd Semester**

<table>
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<tr>
<th>Course Number</th>
<th>Courses</th>
<th>Lecture</th>
<th>Tutorial</th>
<th>Lab</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 203</td>
<td>Ordinary Differential Equations</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>DPEM 204</td>
<td>Probability for Engineers</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>MECH 201</td>
<td>Engineering Mechanics – Strength of materials</td>
<td>3</td>
<td>-</td>
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<tr>
<td>DPEM 202</td>
<td>Materials Science</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>4</td>
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<tr>
<td>KEP 101</td>
<td>Sociology</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>LANG 201</td>
<td>English III or German III</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>3</td>
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</tbody>
</table>

**Required electives**: Students should select one (1) course from the following list:

- KEP 301 1 Introduction to Philosophy and History of Science (II) 3 - - 4
- DPEM 203 2 Electronics (III) 3 - 2 4

**TOTAL**

|                  | 20 | 2   | 13  | 30 |
### 4th Semester

<table>
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<tr>
<th>Course Number</th>
<th>Courses</th>
<th>Hours/Week</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lecture</td>
<td>Tutorial</td>
</tr>
<tr>
<td>MATH 202</td>
<td>Numerical Analysis</td>
<td>3</td>
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<tr>
<td>DPEM 228</td>
<td>Engineering Statistics</td>
<td>3</td>
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<tr>
<td>DPEM 221</td>
<td>Linear Programming</td>
<td>2</td>
<td>2</td>
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<tr>
<td>DPEM 222</td>
<td>Engineering Management</td>
<td>3</td>
<td>1</td>
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<tr>
<td>LANG 202</td>
<td>English IV or German IV</td>
<td>2</td>
<td>2</td>
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<td></td>
<td><strong>Required electives:</strong> Students should select one (1) course from the following list:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KEP 102</td>
<td>Political Economy (II)</td>
<td>3</td>
<td>-</td>
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<tr>
<td>KEP 202</td>
<td>History of Civilization (II)</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>KEP 302</td>
<td>Industrial Sociology (II)</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>DPEM 407</td>
<td>Game Theory (VI)</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>DPEM 208</td>
<td>Environmental analysis and planning (V)</td>
<td>3</td>
<td>-</td>
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<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td>16</td>
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### 5th Semester

<table>
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<th>Hours/Week</th>
<th>Credits</th>
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<tr>
<td></td>
<td></td>
<td>Lecture</td>
<td>Tutorial</td>
</tr>
<tr>
<td>DPEM 301</td>
<td>Manufacturing Technology I</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>DPEM 303</td>
<td>Stochastic Processes</td>
<td>4</td>
<td>-</td>
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<tr>
<td>DPEM 305</td>
<td>Machine Elements</td>
<td>2</td>
<td>2</td>
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<tr>
<td>DPEM 224</td>
<td>Thermodynamics</td>
<td>2</td>
<td>1</td>
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<tr>
<td>DPEM 426</td>
<td>Combinatorial Optimization</td>
<td>3</td>
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<tr>
<td></td>
<td><strong>Required electives:</strong> Students should select one (1) course from the following list:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KEP 201</td>
<td>Micro-Macro Economics (II)</td>
<td>3</td>
<td>-</td>
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<tr>
<td>KEP 203</td>
<td>Art and Technology (II)</td>
<td>3</td>
<td>-</td>
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<tr>
<td>DPEM 306</td>
<td>Introduction to Artificial Intelligence (IV)</td>
<td>3</td>
<td>-</td>
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<tr>
<td>DPEM 302</td>
<td>Human Resource Management (VII)</td>
<td>3</td>
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<td><strong>TOTAL</strong></td>
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### 6th Semester

<table>
<thead>
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<th>Hours/Week</th>
<th>Credits</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Lecture</td>
<td>Tutorial</td>
</tr>
<tr>
<td>DPEM 321</td>
<td>Manufacturing Technology II</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>DPEM 322</td>
<td>Production Systems</td>
<td>4</td>
<td>-</td>
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<tr>
<td>DPEM 324</td>
<td>Decision Support Systems</td>
<td>2</td>
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<tr>
<td>DPEM 325</td>
<td>Non-Linear Programming</td>
<td>2</td>
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<td>DPEM 223</td>
<td>Fluid Mechanics</td>
<td>3</td>
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<td><strong>Required electives:</strong> Students should select one (1) course from the following list:</td>
<td></td>
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<tr>
<td>DPEM 432</td>
<td>Dynamics, Vibrations &amp; Control of Structures (III)</td>
<td>2</td>
<td>2</td>
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<tr>
<td>DPEM 230</td>
<td>Electronic Business (IV)</td>
<td>2</td>
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<tr>
<td>DPEM 323</td>
<td>Data Analysis (VII)</td>
<td>2</td>
<td>2</td>
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<tr>
<td>DPEM 512</td>
<td>Financial Risk Management (VII)</td>
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### 7th Semester

<table>
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<th>Tutorial</th>
<th>Lab</th>
<th>Credits</th>
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<tbody>
<tr>
<td>DPEM 401</td>
<td>Control Systems I</td>
<td>4</td>
<td>-</td>
<td>2</td>
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<tr>
<td>DPEM 402</td>
<td>Financial Management</td>
<td>2</td>
<td>-</td>
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<tr>
<td>DPEM 405</td>
<td>Quality Control</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>5</td>
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<tr>
<td>DPEM 406</td>
<td>Marketing</td>
<td>3</td>
<td>-</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>DPEM 304</td>
<td>Heat Transfer</td>
<td>2</td>
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</tbody>
</table>

Required electives: Students should select one (1) course from the following list:

- KEP 204 1 Introduction to Legal Systems and Technical Legislation (II) 3 - - 4
- DPEM 504 2 Topics in Environmental Protection (III) 2 - 2 4
- DPEM 517 3 Power System Economics (III) 3 - - 4
- DPEM 435 4 Enterprise Resource-Planning Systems (IV) 2 - 2 4
- DPEM 403 5 Reliability Theory (V) 3 - - 4

**TOTAL** 15-16 3 6-8 30

### 8th Semester

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Courses</th>
<th>Lecture</th>
<th>Tutorial</th>
<th>Lab</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>DPEM 421</td>
<td>Production Networks (CAM)</td>
<td>4</td>
<td>-</td>
<td>2</td>
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<tr>
<td>DPEM 422</td>
<td>Investment Decision Analysis</td>
<td>2</td>
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<td>2</td>
<td>4</td>
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<tr>
<td>DPEM 423</td>
<td>Computer-Aided Design (CAD)</td>
<td>3</td>
<td>-</td>
<td>2</td>
<td>4</td>
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<tr>
<td>DPEM 424</td>
<td>Ergonomics</td>
<td>3</td>
<td>-</td>
<td>3</td>
<td>4</td>
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<tr>
<td>DPEM 326</td>
<td>Hydrodynamic and Thermal Engines</td>
<td>3</td>
<td>-</td>
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</table>

Required electives: Students should select two (2) courses from the following list:

- DPEM 434 1 Microscale Manufacturing Technologies (III) 1 - 2 4
- DPEM 425 2 Dynamic Programming (VI) 2 1 2 4
- DPEM 430 3 Control Systems II (V) 3 - 2 4
- DPEM 431 4 Computational Mechanics (III) 2 - 2 4
- DPEM 408 5 Total Quality Management (VII) 3 - - 4
- DPEM 433 6 Small & Medium Enterprises (SMEs) and Innovation (VII) 2 - 2 4
- DPEM 506 7 Strategic Planning (VII) 3 - - 4
- Free Electives
- Practical Training II
- Field Trip

**TOTAL** 18-21 0-1 11-13 30
### 9th Semester

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Courses</th>
<th>Hours/Week</th>
<th>Credits</th>
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<tbody>
<tr>
<td>DPEM 502</td>
<td>Robotics</td>
<td>3</td>
<td>2</td>
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<tr>
<td>DPEM 409</td>
<td>Project and Production Management &amp; Scheduling</td>
<td>2</td>
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**Required electives:** Students should select four (4) courses from the following list:

<table>
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<th>Hours/Week</th>
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</thead>
<tbody>
<tr>
<td>DPEM 515</td>
<td>Mechatronics (V)</td>
<td>3</td>
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<tr>
<td>DPEM 516</td>
<td>Renewable Energy Sources (III)</td>
<td>3</td>
<td>-</td>
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<tr>
<td>DPEM 518</td>
<td>Business Intelligence and Knowledge Management (IV)</td>
<td>2</td>
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<tr>
<td>DPEM 501</td>
<td>Simulation (V)</td>
<td>4</td>
<td>2</td>
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<tr>
<td>DPEM 513</td>
<td>Product Design and Development (V)</td>
<td>2</td>
<td>2</td>
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<tr>
<td>DPEM 514</td>
<td>Design and Optimization in Supply Chain Management (VI)</td>
<td>3</td>
<td>2</td>
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<tr>
<td>DPEM 427</td>
<td>Financial Calculus (VII)</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>DPEM 505</td>
<td>Ergonomic Work Analysis (VII)</td>
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<td>-</td>
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<tr>
<td>DPEM 507</td>
<td>Technological Forecasting (VII)</td>
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<tr>
<td>DPEM 510</td>
<td>Engineering Economics and Business Plan Analysis (VII)</td>
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</table>

**TOTAL** | 13-18 | 0-5 | 4-12 | 30

SEMINARS | Geographic Information Systems | 2

### 10th Semester

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Courses</th>
<th>Hours/Week</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Diploma Thesis</td>
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<td>30</td>
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</tbody>
</table>

**TOTAL** | - | - | - | -

SEMINARS | Business Process Modeling | 3
Data Mining – OLAP Systems – Data Mining for Decision Making | 2
Students should select and successfully complete exactly one (1) course from electives in Group II and at least:
one (1) course from electives in Group III; one (1) course from electives in Group IV; one (1) course from elec-
tives in Group V; one (1) course from electives in Group VI; one (1) course from electives in Group VII.

<table>
<thead>
<tr>
<th>Group II</th>
<th>Group III</th>
<th>Group IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities - Foreign Languages</td>
<td>Electromechanical Systems</td>
<td>Information Systems</td>
</tr>
<tr>
<td><strong>Select: 1 Course</strong></td>
<td><strong>Select: 1 Course</strong></td>
<td><strong>Select: 1 Course</strong></td>
</tr>
<tr>
<td>2. Micro-Macro Economics</td>
<td>2. Dynamics, Vibrations &amp; Control of Structures</td>
<td>2. Introduction to Artificial Intelligence</td>
</tr>
<tr>
<td>4. Introduction to Philosophy and History of Science</td>
<td>4. Computational Mechanics</td>
<td>4. Business Intelligence and Knowledge Management</td>
</tr>
<tr>
<td>5. Introduction to Legal Systems and Technical Legislation</td>
<td>5. Renewable Energy Sources</td>
<td></td>
</tr>
<tr>
<td>6. Art and Technology</td>
<td>6. Electric Economy</td>
<td></td>
</tr>
<tr>
<td>7. Industrial Sociology</td>
<td>7. Microscale Manufacturing Technologies</td>
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<table>
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<tr>
<th>Group V</th>
<th>Group VI</th>
<th>Group VII</th>
</tr>
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<tbody>
<tr>
<td>Production Systems</td>
<td>Operations Research</td>
<td>Management</td>
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<td><strong>Select: 1 Course</strong></td>
<td><strong>Select: 1 Course</strong></td>
<td><strong>Select: 1 Course</strong></td>
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<tr>
<td>2. Reliability Theory</td>
<td>2. Dynamic Programming</td>
<td>2. Data Analysis</td>
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<tr>
<td>5. Product Design and Development</td>
<td></td>
<td>5. Small &amp; Medium Enterprises (SMEs) and Innovation</td>
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<td>7. Strategic Planning</td>
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<td>8. Technological Forecasting</td>
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<td>9. Engineering Economics and Business Plan Analysis</td>
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<td>10. Financial Risk Management</td>
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4. Course Descriptions

**Group I (Mathematical-Physical Sciences)**

<table>
<thead>
<tr>
<th>Required Courses</th>
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<tr>
<td><strong>(MATH 101) Differential and Integral Calculus I</strong></td>
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<tr>
<td>Academic Responsible: Department of Sciences</td>
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</tr>
</tbody>
</table>

| **(MATH 102) Differential and Integral Calculus II**                             | 5       |
| Academic Responsible: Department of Sciences |         |

| **(MATH 201) Linear Algebra**                                                  | 5       |
| Academic Responsible: Department of Sciences |         |

| **(MATH 202) Numerical Analysis**                                             | 6       |
| Academic Responsible: Department of Sciences |         |

| **(MATH 203) Ordinary Differential Equations**                                | 5       |
(DPEM 204) Probability for Engineers


Academic Responsible: Nikolaos Vlassis

(DPEM 228) Engineering Statistics


Academic Responsible: Efstratios Ioannidis

(DPEM 303) Stochastic Processes


Academic Responsible: Yannis Phillis

(PHYS 101) Physics I


Academic Responsible: Department of Sciences

(PHYS 102) Physics II


Academic Responsible: Department of Sciences

(CHEM 103) General Chemistry


Academic Responsible: Department of Sciences

<table>
<thead>
<tr>
<th>Group II (Humanities-Foreign Languages)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Required Courses</strong></td>
</tr>
</tbody>
</table>

**KEP 101) Sociology**

In this introductory course analytical and synthetic approaches are used to investigate topics related to the social framework within which human productive activity is realized. Topics covered include: society, societal positions and roles, social change, social stratification and mobility, social categories and classes, socio-political institutions, socio-economical institutions and transformations.

Academic Responsible: Department of Sciences

**LANG 201) English III or German III**

**English III**: English III combines an independent study program in the Language Center with a series of department- and field-of-study- specific work modules. These modules focus on developing verbal, written and comprehension language skills. Students are required to register and participate in the e-class of this course as well as use the required or recommended resources of the Language Center. The final grade is determined by a series of assignments and quizzes throughout the semester and a final exam.

German III: In German III special emphasis is placed on the introduction of students to technical terminology both in verbal and written communication. In this class students are trained using articles and technical texts properly adapted to the type of exercise and their field-of-study. The goals of the class are to further enhance writing and comprehension skills developed as part of the German I and II courses. Complementary to regular lectures, students are encouraged to utilize department- and field-of-study- specific audio-visual material available at the Language Center as well as electronically-available exercises.

Academic Responsible: Department of Sciences

**LANG 202) English IV or German IV**

**English IV**: Students in English IV will be required to study texts and vocabulary using material related to their fields of study. Students are expected to register and participate in the e-class of the class and use the required or recommended resources of the Language Center. Assignments and quizzes in the duration of the semester in conjunction with a final exam are used to determine the student’s final grade.

**German IV**: Students following the sequence of German courses in the Technical University of Crete have significantly developed their German language skills. The aim of this course is to further enhance language skills through complex texts and exercises, and help students reach a language competence at the level of Mittelstufe (ZMP). Complementary to regular lectures, students are encouraged to utilize department- and field-of-study- specific audio-visual material available at the Language Center as well as electronically-available exercises.

Students can register in practice groups to further enhance verbal and writing communication skills.

Academic Responsible: Department of Sciences

<table>
<thead>
<tr>
<th>Group II (Humanities-Foreign Languages)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Elective Courses</strong></td>
</tr>
</tbody>
</table>

**KEP 102) Political Economy**

Includes an analysis of basic notional categories and relations in Political Economy, as well as a brief review of recent economic history. Particular references are made to: the theory of valuation, surplus value, pricing, the relationship between competition and distribution, the fundamental trends and incongruities of amplification, and financial crisis phenomena.
(KEP 201) Micro-Macro Economics

Includes an analysis of commodity supply and demand, consumer theory and corporate theory. On a macroscopic level the issues analyzed include the income and employment determination, inflation, the role of investments, and the problems or development trends within the world economy.

(KEP 202) History of Civilization

Using as a departure point basic knowledge from individual branches of social sciences (sociology, anthropology, philosophy, political economy etc.), an analytical and synthetic approach is taken to notions and issues related the history of civilization both in general and for specific periods (Eastern despotisms, Ancient Greece, Middle Ages, Renaissance etc.). A study from a critical perspective is taken on certain theories that attempt to interpret modern civilization (behaviorism, postmodernism, etc.).

(KEP 203) Introduction to Philosophy and History of Science

Science as a social-cultural phenomenon. The position and role of science in the social structure. Theoretical issues concerning knowledge, logic and the methodology of scientific research. Science throughout history. Differentiation, integration and interdisciplinarity of science. Traditions and innovations in the development of science. The subject of scientific activity. Theories, directions and approaches in the philosophy of science.

(KEP 204) Introduction to Legal Systems and Technical Legislation

Introduction to legal systems (the role of law, the legal theory of state, aspof human rights), industrial relations (introductions to the individual contract of employment, trade union rights, collective bargaining, industrial accidents and hygiene and safety at work), introduction to the law of environment protection (principles of environment protection constitutional and general law protection), introduction to the law of natural resources (principles of rights for exploration and exploitation of natural resources in the constitution and the general law).

(KEP 301) Art and Technology

Technology and Art in the social structure. Technology as objectification, as a framework for the human impact on nature and for the relations among people, as a forerunning conception-knowledge and as an instrument implicating upon nature. The particularity of the aesthetic moment. The aesthetic moment as a specific activity in the division of labor (art). Basic aesthetic categories. The social purpose of art. Art and technology in the history of civilization. Metaphysical discourse on "Appollonean" and "Dionysean" elements. The synthetic dimension of creativity.

(KEP 302) Industrial Sociology

Lectures on Sociology of Labor and Sociology of Development, with particular reference on the historical approach of production systems and on recent changes concerning industry in relation with other sectors of economic and scientific activities. Analytic and synthetic approach, at several levels (international, national, regional-local), concerning crisis and restructuring strategies, “flexible” production and labor organization, labor market, industrial relations, inter-firm relations, local production systems, research and technological development, innovations, know-how, industrial policy.
### Group III (Electromechanical Systems)

<table>
<thead>
<tr>
<th>Required Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>(MECH 101) Computer-Aided Mechanical Drafting</strong></td>
<td>4</td>
</tr>
<tr>
<td>Academic Responsible: George Poulidakis, Aristomenis Antoniadis</td>
<td></td>
</tr>
<tr>
<td><strong>(MECH 102) Engineering Mechanics – Statics</strong></td>
<td>6</td>
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<tr>
<td>Academic Responsible: Department of Sciences</td>
<td></td>
</tr>
<tr>
<td>Academic Responsible: Department of Sciences</td>
<td></td>
</tr>
<tr>
<td><strong>(DPEM 121) Electric Circuits</strong></td>
<td>5</td>
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<tr>
<td>Academic Responsible: Fotios Kanellos</td>
<td></td>
</tr>
<tr>
<td><strong>(DPEM 202) Materials Science</strong></td>
<td>4</td>
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<tr>
<td>Academic Responsible: Department of Sciences</td>
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<tr>
<td><strong>(DPEM 223) Fluid Mechanics</strong></td>
<td>5</td>
</tr>
<tr>
<td>Academic Responsible: Ioannis Nikolos</td>
<td></td>
</tr>
</tbody>
</table>
(DPEM 224) Thermodynamics


Academic Responsible: Dimitrios Rovas

(DPEM 304) Heat Transfer


Academic Responsible: Dimitrios Rovas

(DPEM 305) Machine Elements


Academic Responsible: Aristomenis Antoniadis

(DPEM 326) Hydrodynamic and Thermal Engines


Academic Responsible: Ioannis Nikolos

(DPEM 502) Robotics


Academic Responsible: DPEM

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Group III (Electromechanical Systems)

Elective Courses

(DPEM 203) Electronics

Analog electronics: semiconductor physics, rectifying diodes, special diodes, diodes circuits and applications, bipolar junction transistor, common emitter voltage amplifiers, operational amplifiers, JFET, MOSFET. Digital electronics: digital circuit analysis and design. Binary systems: binary numbers, binary codes, binary logic.

Academic Responsible: Fotios Kanellos

(DPEM 432) Dynamics, Vibrations & Control of Structures


Academic Responsible: Georgios Stavroulakis

(DPEM 434) Microscale Manufacturing Technologies


Academic Responsible: Aristomenis Antoniadis

(DPEM 504) Topics in Environmental Protection

Basic principles of ecology, geochemical cycles. Atmospheric pollution, water pollution, waste management methodologies, statistical analysis of environmental data, wastewater treatment, solid waste management.

Academic Responsible: Konstantinos Komnitsas, MRED

(DPEM 515) Computational Mechanics


Academic Responsible: Georgios Stavroulakis

(DPEM 516) Renewable Energy Sources

Introduction. Wind energy: energy and power in the wind, wind turbine types and configuration, power and energy from wind turbines, electrical system, grid connection of wind turbines, applications. Photovoltaic systems: solar energy characteristics, photovoltaic installations, electrical connection, application. Autonomous systems. Penetration and utilization of renewable energy sources.

Academic Responsible: Spyros Papaefthimiou

(DPEM 517) Electric Economy


Academic Responsible: Fotios Kanellos
## Group IV (Information Systems)

### Required Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
<th>Academic Responsible</th>
</tr>
</thead>
</table>

### Elective Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
<th>Academic Responsible</th>
</tr>
</thead>
</table>

Academic Responsible: Anastasios Doulamis

(DPEM 435) Enterprise Resource Planning Systems  
Credits: 4

Introduction to Information Systems, Enterprise resource planning systems (ERPs), Customer Relationship Management Systems (CRMs), System architectures, components, modules and technical infrastructure of ERPs, System's analysis and design, Business processes in ERPs, Business Process Reengineering, Specific ERP components (Manufacturing, Financials, Supply chain management, Warehouse Management, Distribution, Marketing, Sales, Human Resources Management, Logistics), Operations that ERP support, pros and cons of using ERPs, E-commerce and ERP, Business Intelligence and ERP, ERP and Data Warehouses – OLAP, Success factors of ERPs, Feasibility study of getting an ERP, Evaluating, selecting, installing, configuring and customizing an ERP, Production Planning through ERPs, Material requirements and resource planning (MRP I & MRP II), Demonstration of the MBS Navision ERP, MBS Navision CRM. Special issues: Enterprise Application Integration, Interoperability, Service-Oriented Computing, Web Services.

Academic Responsible: Nikolaos Matsatsinis

(DPEM 518) Business Intelligence and Knowledge Management  
Credits: 5


Academic Responsible: Nikolaos Matsatsinis

Group V (Production Systems)

Required Courses

(DPEM 301) Manufacturing Technology I  
Credits: 6


Academic Responsible: Nikolaos Tsourveloudis

(DPEM 321) Manufacturing Technology II  
Credits: 6


Academic Responsible: Nikolaos Tsourveloudis

33
(DPEM 322) Production Systems
Credits: 5
Introduction. Inventory systems with static, dynamic and stochastic demand. Discounted orders. Production planning, forecasting methods, moving average, minimum squared error. ARMA models. Scheduling jobs in one and two machines. Required precedence among jobs. Sequence-dependent set-up times.
Academic Responsible: DPEM

(DPEM 401) Control Systems I
Credits: 6
Academic Responsible: Anastasios Pouliezos

(DPEM 421) Production Networks (CAM)
Credits: 6
Introduction to queuing theory, birth-death models, M|M|1, M|M|m, M|M|m|K|N systems. Non birth-death Markovian models. Erlang distribution. Batch arrivals/service. Advanced models M|G|1, M|G|m, G|G|1, G|G|m. Advanced models for the analysis of production lines. Introduction to flexible manufacturing systems (FMS) – analytical tools and control issues.
Academic Responsible: Yannis Phillis

(DPEM 405) Quality Control
Credits: 5
Academic Responsible: Evangelos Grigoroudis

(DPEM 423) Computer-Aided Design (CAD)
Credits: 4
Academic Responsible: Nikolaos Bilalis

Group V (Production Systems)

<table>
<thead>
<tr>
<th>Elective Courses</th>
</tr>
</thead>
</table>

(DPEM 403) Reliability Theory
Credits: 4
Academic Responsible: Vassilis Kouikoglou

(DPEM 430) Control Systems II
Credits: 4
(DPEM 431) Mechatronics
Academic Responsible: Georgios Stavroulaklis

(DPEM 501) Simulation
Simulation of production and queuing systems, discrete event modeling, random variate generators, statistical techniques for performance estimation and comparison of alternative systems, variance reduction techniques, introduction to perturbation analysis and optimization of queuing systems.
Academic Responsible: Vassilis Kouikoglou

(DPEM 513) Product Design and Development
Academic Responsible: Nikolaos Bilalis

(DPEM 208) Environmental analysis and planning
Academic Responsible: Spyros Papaefthymiou

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<table>
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<tr>
<th>Group VI (Operations Research)</th>
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<tbody>
<tr>
<td><strong>Required Courses</strong></td>
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<tr>
<td>(DPEM 102) Operations Research Methodology</td>
</tr>
<tr>
<td>Methodological framework of operations research. Introduction to graph theory with applications to project management. Inventory control. Wilson's model and extensions. Introduction to linear programming. Multiple-criteria decision making. Case studies.</td>
</tr>
<tr>
<td>Academic Responsible: Michael Doumpos</td>
</tr>
</tbody>
</table>

(DPEM 221) Linear Programming
Academic Responsible: Michael Doumpos
(DPEM 325) Non-linear Programming


Academic Responsible: Markos Papageorgiou

(Credits: 5)

(DPEM 409) Project and Production Management & Scheduling


Academic Responsible: Ioannis Papamichail

(Credits: 5)

(DPEM 426) Combinatorial Optimization


Academic Responsible: Yannis Marinakis

(Credits: 6)

Group VI (Operations Research)

Elective Courses

(DPEM 407) Game Theory


Academic Responsible: Yannis Marinakis

(Credits: 4)

(DPEM 425) Dynamic Programming


Academic Responsible: Markos Papageorgiou

(Credits: 4)

(DPEM 514) Design and Optimization in Supply Chain Management


Academic Responsible: Yannis Marinakis

(Credits: 5)

Academic Responsible: Yannis Marinakis

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### Group VII (Management)

#### Required Courses

**DPEM 222) Engineering Management**


Academic Responsible: Vassilis Moustakis

**DPEM 402) Financial Management**


Academic Responsible: Constantin Zopounidis

**DPEM 406) Marketing**


Academic Responsible: DPEM

**DPEM 422) Investment Decision Analysis**


Academic Responsible: Constantin Zopounidis

**DPEM 424) Ergonomics**


Academic Responsible: Tom Kontogiannis

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#### Elective Courses

**DPEM 302) Human Resource Management**


Academic Responsible: Vassilis Moustakis
(DPEM 323) Data Analysis
Credits: 4

Academic Responsible: DPEM

(DPEM 408) Total Quality Management
Credits: 4

Academic Responsible: Evangelos Grigoroudis

(DPEM 427) Financial Calculus
Credits: 5

Academic Responsible: Michael Doumpos

(DPEM 433) Small & Medium Enterprises (SMEs) and Innovation
Credits: 4

Academic Responsible: Constantin Zopounidis, Nikolaos Matsatsinis, Evangelos Grigoroudis

(DPEM 505) Ergonomic Work Analysis
Credits: 5

Academic Responsible: Tom Kontogiannis

(DPEM 506) Strategic Planning
Credits: 4

Academic Responsible: Fotios Pasiouras

(DPEM 507) Technological Forecasting
Credits: 5

Academic Responsible: DPEM

(DPEM 510) Engineering Economics and Business Plan Analysis
Credits: 5
Life-cycle costing. Cost estimation: volume-based costing and activity based costing. Benefit/cost as-

Academic Responsible: Vassilis Moustakis

(DPEM 512) Financial Risk Management


Academic Responsible: Fotios Pasiouras
5. Contact Information

5.1 Mailing Address

The mailing address of the department is:

Technical University of Crete
Department of Production Engineering and Management
University Campus
731 00 Chania, Greece

5.2 Department Contact Information

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Rector of Technical University of Crete  
(+30)-28210 37005-6

Head of the Department

Georgios Stavroulakis, Professor  
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Associate Head of the Department

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(+30)-28210 69410

DPEM Registrar’s Office

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Stela Mountogiannaki  
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Registrar’s Office FAX  
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### 5.3 Faculty Members of the Department

<table>
<thead>
<tr>
<th>Order</th>
<th>Name</th>
<th>Email</th>
<th>Phone</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Antoniadis, Aristomenis</td>
<td><a href="mailto:antoniadis@dpem.tuc.gr">antoniadis@dpem.tuc.gr</a></td>
<td>(+30)-28210 37293</td>
</tr>
<tr>
<td>2.</td>
<td>Bilalis, Nikolaos</td>
<td><a href="mailto:bilalis@dpem.tuc.gr">bilalis@dpem.tuc.gr</a></td>
<td>(+30)-28210 37447</td>
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<tr>
<td>3.</td>
<td>Doulamis, Anastasios</td>
<td><a href="mailto:adoulam@dpem.tuc.gr">adoulam@dpem.tuc.gr</a></td>
<td>(+30)-28210 37430</td>
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<tr>
<td>4.</td>
<td>Doumpos, Michael</td>
<td><a href="mailto:mdoumpos@dpem.tuc.gr">mdoumpos@dpem.tuc.gr</a></td>
<td>(+30)-28210 37338</td>
</tr>
<tr>
<td>5.</td>
<td>Grigoroudis, Evangelos</td>
<td><a href="mailto:vangelis@ergasya.tuc.gr">vangelis@ergasya.tuc.gr</a></td>
<td>(+30)-28210 37346</td>
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<tr>
<td>6.</td>
<td>Ioannidis, Efstratios</td>
<td><a href="mailto:efoan@dpem.tuc.gr">efoan@dpem.tuc.gr</a></td>
<td>(+30)-28210 37392</td>
</tr>
<tr>
<td>7.</td>
<td>Kanellos, Fotios</td>
<td><a href="mailto:fkanellos@dpem.tuc.gr">fkanellos@dpem.tuc.gr</a></td>
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</tr>
<tr>
<td>8.</td>
<td>Kontogiannis, Tom</td>
<td><a href="mailto:konto@dpem.tuc.gr">konto@dpem.tuc.gr</a></td>
<td>(+30)-28210 37320</td>
</tr>
<tr>
<td>9.</td>
<td>Kouikoglou, Vassilis</td>
<td><a href="mailto:kouik@dpem.tuc.gr">kouik@dpem.tuc.gr</a></td>
<td>(+30)-28210 37238</td>
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<td>10.</td>
<td>Marinakis, Yannis</td>
<td><a href="mailto:marinakis@ergasya.tuc.gr">marinakis@ergasya.tuc.gr</a></td>
<td>(+30)-28210 37288</td>
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<tr>
<td>11.</td>
<td>Matsatsinis, Nikolaos</td>
<td><a href="mailto:nikos@ergasya.tuc.gr">nikos@ergasya.tuc.gr</a></td>
<td>(+30)-28210 37348</td>
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<td>12.</td>
<td>Moustakis, Vassilis</td>
<td><a href="mailto:moustaki@dpem.tuc.gr">moustaki@dpem.tuc.gr</a></td>
<td>(+30)-28210 37511</td>
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<tr>
<td>13.</td>
<td>Nikolos, Ioannis</td>
<td><a href="mailto:jnikolo@dpem.tuc.gr">jnikolo@dpem.tuc.gr</a></td>
<td>(+30)-28210 37300</td>
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<tr>
<td>14.</td>
<td>Papaefthymiou, Spyros</td>
<td><a href="mailto:spapaefthymiou@dpem.tuc.gr">spapaefthymiou@dpem.tuc.gr</a></td>
<td>(+30)-28210 37428</td>
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<tr>
<td>15.</td>
<td>Papageorgiou, Markos</td>
<td><a href="mailto:markos@dssl.tuc.gr">markos@dssl.tuc.gr</a></td>
<td>(+30)-28210 37240</td>
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<td>16.</td>
<td>Papamichail, Ioannis</td>
<td><a href="mailto:ipapa@dssl.tuc.gr">ipapa@dssl.tuc.gr</a></td>
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<tr>
<td>17.</td>
<td>Pasiouras, Fotis</td>
<td><a href="mailto:pasiouras@dpem.tuc.gr">pasiouras@dpem.tuc.gr</a></td>
<td>(+30)-28210 37239</td>
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<td>18.</td>
<td>Phillis, Yannis</td>
<td><a href="mailto:phillis@dpem.tuc.gr">phillis@dpem.tuc.gr</a></td>
<td>(+30)-28210 37321</td>
</tr>
<tr>
<td>19.</td>
<td>Pouliezos, Anastasios</td>
<td><a href="mailto:tasos@dpem.tuc.gr">tasos@dpem.tuc.gr</a></td>
<td>(+30)-28210 37313</td>
</tr>
<tr>
<td>20.</td>
<td>Rovas, Dimitrios</td>
<td><a href="mailto:rovas@dpem.tuc.gr">rovas@dpem.tuc.gr</a></td>
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<tr>
<td>21.</td>
<td>Stavroulakis, Georgios</td>
<td><a href="mailto:gestavr@dpem.tuc.gr">gestavr@dpem.tuc.gr</a></td>
<td>(+30)-28210 37418</td>
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<td>22.</td>
<td>Tsourveloudis, Nikolaos</td>
<td><a href="mailto:nikost@dpem.tuc.gr">nikost@dpem.tuc.gr</a></td>
<td>(+30)-28210 37285</td>
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<tr>
<td>23.</td>
<td>Zopounidis, Constantin</td>
<td><a href="mailto:kostas@dpem.tuc.gr">kostas@dpem.tuc.gr</a></td>
<td>(+30)-28210 37216</td>
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### 5.4 Laboratories

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<tr>
<th>Order</th>
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<tbody>
<tr>
<td>1.</td>
<td>Decision Support Systems</td>
<td>Lia Krasadaki (<a href="mailto:lia@ergasya.tuc.gr">lia@ergasya.tuc.gr</a>)</td>
<td>(+30)-28210 37350</td>
</tr>
<tr>
<td>2.</td>
<td>Dynamic Systems and Simulation</td>
<td>Evangelos Voudourakis (<a href="mailto:vangelis@dssl.tuc.gr">vangelis@dssl.tuc.gr</a>)</td>
<td>(+30)-28210 37308</td>
</tr>
<tr>
<td>3.</td>
<td>Computer-Aided Manufacturing (CAM)</td>
<td>George Tsinarakis (<a href="mailto:tsinar@dpem.tuc.gr">tsinar@dpem.tuc.gr</a>)</td>
<td>(+30)-28210 37325</td>
</tr>
<tr>
<td>4.</td>
<td>Intelligent Systems and Robotics Laboratory</td>
<td>Savvas Piperidis (<a href="mailto:sava@dpem.tuc.gr">sava@dpem.tuc.gr</a>)</td>
<td>(+30)-28210 37292</td>
</tr>
<tr>
<td>5.</td>
<td>Industrial Systems Control Laboratory</td>
<td>Magdalene Marinaki (<a href="mailto:maga@dssl.tuc.gr">maga@dssl.tuc.gr</a>)</td>
<td>(+30)-28210 37340</td>
</tr>
<tr>
<td>6.</td>
<td>Data Analysis and Forecasting</td>
<td>George Atsalakis (<a href="mailto:atsalakis@ermes.tuc.gr">atsalakis@ermes.tuc.gr</a>)</td>
<td>(+30)-28210 37263</td>
</tr>
<tr>
<td>7.</td>
<td>Work Safety and Cognitive Economics</td>
<td>George Papadakis (<a href="mailto:gpap@dpem.tuc.gr">gpap@dpem.tuc.gr</a>)</td>
<td>(+30)-28210 37316</td>
</tr>
<tr>
<td>8.</td>
<td>Management Systems</td>
<td>Loukas Tsironis (<a href="mailto:loukas@dpem.tuc.gr">loukas@dpem.tuc.gr</a>)</td>
<td>(+30)-28210 37361</td>
</tr>
<tr>
<td>9.</td>
<td>Financial Engineering</td>
<td>Aggeliki Liadaki (<a href="mailto:aggeliki@dpem.tuc.gr">aggeliki@dpem.tuc.gr</a>)</td>
<td>(+30)-28210 37360</td>
</tr>
<tr>
<td>10.</td>
<td>Computer-Aided Design(CAD)</td>
<td>Pavlos Kououlidakis (<a href="mailto:pavloskoul@gmail.com">pavloskoul@gmail.com</a>)</td>
<td>(+30)-28210 37256</td>
</tr>
<tr>
<td>11.</td>
<td>Computational Mechanics and Optimization</td>
<td>George Stavroulakis (<a href="mailto:gestavr@dpem.tuc.gr">gestavr@dpem.tuc.gr</a>)</td>
<td>(+30)-28210 37418</td>
</tr>
<tr>
<td>12.</td>
<td>Micromachining and manufacturing modeling</td>
<td>Aristomenis Antoniadis (<a href="mailto:antoniadis@dpem.tuc.gr">antoniadis@dpem.tuc.gr</a>)</td>
<td>(+30)-28210 37293</td>
</tr>
</tbody>
</table>
13. Machine Tools Laboratory
Nektarios Heretis (nek_heretis@dpem.tuc.gr) ...................................................(+30)-28210 37286-37349