Azrieli
College of Engineering
Jerusalem

Azrieli - College of Engineering Jerusalem (JCE)

Prof. Eitan Manor, Prof. Avigdor Zangvil, Dr. Rakefet Ofek Almog
Department of Advanced Materials Engineering

College: facts and figures

- Founded 1999 (Non-profit public institution -Tuition fee … in line with Universities)
- About 2000 students in 2014-2015
  - **76% students from Jerusalem & Surroundings**
  - **30% female students**
- About 50 faculty members
- About 250 adjunct faculty

Alumni

- About 2100 graduates
  - **87% working as engineers**
  - **21% studying toward advanced degrees**

College structure

- **Software Engineering** (B.Sc. & M.Sc.)
  (computer communications and decentralized systems)
- **Advanced Materials Engineering** (B.Sc.)
  (Materials for Microelectronics)
- **Industry Engineering and Management** (B.Sc.)
  (Information Systems & Operations Management)
- **Electrical & Electronics Engineering** (B.Sc.)
  (Communications & VLSI & Signal Processing & Computer Engineering)
- **Pharmaceutical Engineering** (B.Sc.)
  (with TEVA)
- **Mechanical Engineering** (B.Sc.)
  (MEMS)
- **Civil & Environmental Engineering** (B.Sc.)
  (with Technion Israel Institute of Technology)
- **Pre-Academic Program**

College structure

…Departments in Development …

2015-2016

- B.Sc. Environmental Technologies Engineering
  (Water-Energy-Nexus)
- M.Sc. Technology Entrepreneurship
  (For Engineers)

Department involved:

- *Advanced Materials Engineering (B.Sc.)*
  - *Classical Materials Engineering*
  - *Materials for Microelectronics*

The Department of Advanced Materials Engineering at JCE is currently in the process of developing an M.Sc. program in Materials Engineering

Aim of Tempus project at JCE:

To adopt/integrate teaching materials, developed by Universities responsible for developing the curricula, in our M.Sc. Program in Materials Engineering

Stakeholders interested in the project outcomes/activities:

Hi-Tech. industries in Israel
Seeking to hire materials engineers

AVX

intel

גל-אל (ממיק)
GAL-EL (MMIC)

APPLIED MATERIALS

omrix Biopharmaceuticals Ltd.

TEVA Pharmaceutical Industries

InSight Biopharmaceuticals

HERLEY GENERAL MICROWAVE ISRAEL

FLEXTRONICS

TOWER SEMICONDUCTOR LTD.

BIOMETRIX

IMI Israel Military Industries Ltd.

IAI ISRAEL AEROSPACE INDUSTRIES

VISHAY

GAS TECHNOLOGIES

IAI ELTA

SOL ENERGY RENEWABLE ENERGY SOLUTIONS

Turbine Services

OPHIR Optronics Solutions

plasan INNOVATE. DELIVER. PROTECT.

CHROMALLOY

M. Sc. - Tentative Study Program

Course Title	Course Type (oblig./elective/ seminar/other)	No. of Credits (Israeli system)*	Weekly Teaching Hours	Weekly Exercise Hours	Weekly Laboratory Hours
Phase transformations and kinetic processes	Oblig.	3.0			
Advanced mechanical properties	Oblig.	3.0			
Materials selection	Oblig.	3.0			
Durability and reliability of materials	Oblig.	3.0			
High temperature materials	Oblig.	3.0			
Advanced composite materials	Oblig.	3.0			
Nanotechnology- materials and processes	Oblig.	3.0			
Casting and solidification technology	Oblig.	3.0			
Electron microscopy and x-ray diffraction	Oblig.	3.0			
Materials engineering seminar	Oblig./ Seminar	3.0			
Final project	Oblig.	10.0			
Advanced semiconductor devices	Elective	3.0			
Materials for renewable energy technologies	Elective	3.0			
Bio-materials	Elective	3.0			
Powder technologies and sintering theory	Elective	3.0			
Total (40 oblig. + 3 elective)		43.0			

- **Israeli Credit System:**
  1 h lecture (During the 14-weeks semester) = 1 credit point;
  1 h practical work or 1 h laboratory (During the 14-weeks semester) = 0.5 credit point;

JCE – Questionnaire No. 1

Dear Faculty/Industry Expert,

The Department of Advanced Materials Engineering at JCE is currently in the process of developing an M.Sc. program in Materials Engineering (Attached: JCE tentative M.Sc. program)

Please see below a questionnaire to analyze current related curricula, proposed by universities responsible for developing the curricula, as a part of the Tempus "MMATENG" Project.

Please give your opinion in the European Credit Transfer and Accumulation System (ECTS) - 1 ECTS credit equals 24-30 total student workload hours.

Sincerely yours,
JCE Workgroup

A questionnaire to analyze current related curricula

MU = MMATENG Universities, Universities responsible for developing the curricula, as a part of the Tempus "MMATENG" Project
EX = Faculty/Industry Expert

JCE M.Sc. Tentative Study Program - Course Name	Tempus Based on Tempus Course	Workload Balance														Comments
		Lectures (Hours)		Practical Work (Hours)		Laboratory Work (Hours)		Total Contact Work (Hours)		Individual Work (Hours)		Total Student Workload (Hours)		ECTS		
		MU	EX	MU	EX	MU	EX	MU	EX	MU	EX	MU	EX	MU	EX	
Nanotechnology-materials and processes	Nano-materials Technologies	36		21		18		75		50		125		5		
Materials Selection	Materials Selection	18		8		-		26		54		80		3		
Durability and Reliability of Materials	Damage and Reliability of Materials	36		20		-		56		40		96		4		
Basics of material science	Basics of material science incl. fatigue behavior	26		16		-		42		50		92		4		Planned to be a transition course for students from other disciplines

Compulsory and Additional literature

Course Name (MMATENG)	Compulsory and Additional literature of the courses proposed by universities responsible for developing the curricula	1. Is the listed literature suitable for the JCE M.Sc. tentative study program? 2. Would you recommend any additional literature for the JCE M.Sc. tentative study program?
Nano materials Technologies	<u>Compulsory Literature</u> Valiev R.Z., Alexandrov I.V., 2007, Bulk nanostructured metallic materials: synthesis, structure and properties, Moscow: ICC "Academkniga"	
	Gusev A.I., 2005, Nano-materials, structures, technologies, Moscow: Fizmatlit	
	<u>Additional Literature</u> Andrievsky R.A., Rahula A.V., 2005, Nanostructured materials, Moscow: Academy	
	Chukin M.V., Koptseva N.V. Efimova Y.Y., Emaleeva D.G.,	
	Baryshnikov M.P., Polyakova M.A., 2011, Structure and properties of nanostructured carbon structural steels:, Magnitogorsk: GOU VPO "MSTU".	
Materials Selection	<u>Compulsory Literature</u> Ashby, 2011, Materials Selection in Mechanical Design, 4th edition, Butterworth Heinemann	
	Ashby, 2009, Materials and the Environment, Butterworth Heinemann	
	<u>Additional Literature</u> Budinski & Budinski, 2010, Engineering Materials, Properties, and Selection, 9th edition, Pearson.	
	D. Jones, M. Ashby, 1996, Engineering Materials Volume 1, Second Edition, Butterworth-Heineman.	
	D. Jones, M. Ashby, 2009, Engineering Materials Volume 2, Second Edition, Butterworth-Heineman.	

Compulsory and Additional literature

Damage and Reliability of Materials	**<u>Compulsory Literature</u>** **Thomas H. Courtney, 1990, Mechanical behaviour of materials, Thomas H. Courtney, Mac Graw-Hill.**	
	Russel H. Jones, 1992, Stress-Corrosion cracking : materials performance and evaluation, ASM International.	
	P. Marcus, 2002, Corrosion mechanisms in theory and practice, Marcel Dekker.	
	S. Suresh, 1991, Fatigue of Materials Press, Cambridge University press.	
Basics of materials science incl. fatigue behavior	**<u>Compulsory Literature</u>** **Ivens, 2013, Materials Science, course book made available to students.**	
	<u>Additional Literature</u> **M. Ashby, 2012, Materials: Engineering, Science, Processing and Design (2nd edition), Elsevier.**	
	D. Jones, M. Ashby, 1996, Engineering Materials Volume 1, Second Edition, Butterworth-Heineman.	
	J. Shackelford, 1996, Introduction to Materials Science for Engineers, 7th edition, Pearson.	

Local project team:

Prof. Eitan Manor
Materials Engineering

Vice President for Academic Affairs
Head, Department of Advanced Materials Engineering

Research Interests:
Ceramic-Metal Composites
Nanostructured Ceramics
Hydrogen Embrittlement

Prof. Avigdor Zangvil
Materials Engineering

Deputy Head, Department of Advanced Materials Engineering

Research Interests:
Processing of Ceramics and Ceramic Matrix Composites
Advanced Ceramic Armor Materials
Ceramic Phase Equilibria and Solid Solutions
Sintering and Properties of Nanoscale Ceramics

Dr. Rakefet Ofek Almog
Materials Engineering

Research Interests:
Polymer-based nano-technologies
Conductive polymers
Composite materials
Development of implanted electrode devices
Electrochemical characterization of biochips and electrode devices

Contacts:

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The Campus Today

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