INDUSTRIAL ENGINEERING, Curriculum

Requirements according to Study Tracks:

Research Track

	Industrial Engineering	Industrial Engineering & Management	Combined with MBA
Mandatory	6	6	6
Core	10	10	10
All Cores & Electives	4-8	2	2
Management	0-4	9	-
Total for degree	24	27	18

For specializations students must choose core courses of the elected specialization and write a thesis in the relevant field.

Final Project Track

	Industrial Engineering	Industrial Engineering & Management
Mandatory	6	6
Core	12	12
All Cores & Electives	12-18	8
Management	0-6	12
Total for degree	36	38

For specializations students must choose core courses of the elected specialization and conduct a final project in the relevant field.

Courses in the Program:

Mandatory courses

M.Sc. students in all tracks must take the following mandatory courses during their first year of studies:

Course No.	Course name	Credit points	Hours	Prerequisites
0572.5110	Applied Optimization for Engineers	3	3	Deterministic Models of Operations Research
0572.5225	Stochastic Methods for Industrial Engineering	3	3	Stochastic Models of Operations Research

Core courses for Operations & Logistics specialization (not all courses are given every year)

Course No.	Course name	Credit points	Hours	Prerequisites
0571.4159	Service Systems	2	3	Analysis of Production Systems; Stochastic Models of Operations Research; Deterministic Models of Operations Research
0572.5201	Dynamic Systems	2	2	
0572.5256	Design of Production Lines	2	2	Analysis of Production Systems
0572.5257	Combinatorial Optimization from Theory to Practice	2	2	Applied Optimization for Engineers
0572.5302	Operations Scheduling	2	2	Analysis of Production Systems
0572.5305	Supply Chain Management	2	2	Analysis of Inventory Systems
0572.5308	Management of Distribution Systems	2	2	Applied Optimization for Engineers
0572.5353	Operation of Transportation Systems	2	2	Applied Optimization for Engineers
0572.5357	Game Models in Operation Systems	2	2	Introduction to Probability

Core courses for Business Analytics specialization (not all courses are given every year)

Course No.	Course name	Credit points	Hours	Prerequisites
0365.4063	Statistical Learning	3	3	Probability; Statistics
0510.6205	Statistical Machine Learning	3	3	Random signals and Noise
0572.5112	Applications of Information Theory to Search Problems	2	2	Probability; Statistics
0572.5118	Applications of Anomaly Detection in Service and Industrial Systems	2	2	
0572.5120	Data Privacy	2	2	Introduction to Probability; Communication Networks
0572.5122	Data Visualization	2	2	
0572.5135	Big Data Technologies and Databases 3	2	2	Programming; Statistical Analysis of Data;

				Introduction to Information Systems; Data Warehousing
0572.5139	Introduction to Data Science 3	2	2	Design of Database Systems; Data Warehousing
0572.5320	Curiosity: Models and Applications	2	2	Optimization and Meta-Heuristics
0572.5448	Advanced Data Mining for Structured and Unstructured Data	2	2	Design of Database Systems; Deterministic and Stochastic Models
0571.4160	Information Retrieval and Recommender Systems 1	2	3	Programming; Linear Algebra; Optimization and Meta-Heuristics; Data Structures
0571.4180	Information Security 1	2	3	Linear Algebra; Analysis and Design of Information Systems

Core courses for the Humans Aspects of Systems specialization (not all courses are given every year)

Course No.	Course name	Credit points	Hours	Prerequisites
0571.4159	Service Systems 1	2	3	Analysis of Production Systems; Stochastic Models of Operations Research; Deterministic Models of Operations Research
0571.4164	Quantitative Models of Human Performance 1,2	2	3	Statistics
0571.4166	Human-Computer Interface Design and Evaluation [1]	2	3	Cognitive Aspects in Human Factors Engineering; Analysis and Design of Information Systems
0572.5117	Research Methods in Human-Computer Interaction	2	2	
0572.5120	Data Privacy	2	2	Introduction to Probability; Communication Networks
0572.5122	Data Visualization	2	2	
0572.5125	Interaction with Autonomous Systems	2	2	Statistics; Stochastic Methods of Operations

				Research; Cognitive Aspects in Human Factors Engineering
0572.5351	Decision Making Under Uncertainty	2	2	
0572.5357	Game Models in Operation Systems	2	2	Introduction to Probability
0572.5362	Human-Robot Interaction	2	2	

Elective Courses (not all courses are given every year)

Course No.	Course name	Credit points	Hours	Prerequisites
0365.2112	Design of Experiments and Analysis of Variance 1	3	4	Statistical Data Analysis
0365.3247	Regression Analysis 1	2	3	Statistics
0365.4078	Statistics for the Big Data	3	3	
0365.4078	Flows in Networks	3	3	Deterministic Models of Operations Research; Linear Algebra
0365.4150	Approximate Algorithms in Combinatorial Optimization	3	3	
0365.4436	Queuing Theory	3	3	Stochastic Methods for Industrial Engineers
0510.6101	Information Theory	3	3	Random Signals and Noise
0510.7003	Scientific Writing in English	None		
0510.7404	Computational Learning Theory	2	2	Data Structures and Algorithms; Introduction to Probability and Statistics
0540.6610	Multi-Objective Optimization	3	3	
0572.5113	Thinking and Creativity: Cognitive Systems for engineers	2	2	
0572.5354	Selected Topics in Industrial Engineering: the Mathematics of Mind	2	2	
0572.5355	Selected Topics in Industrial Engineering: Identifying	2	2	

	Redundancy of Constraints			
0572.5356	Selected Topics in Industrial Engineering: Group Testing	2	2	

Elective Courses in Management

4.1 – For students with a BSc in Industrial Engineering & Management				
Course No.	**Course name**	**Credit points**	**Hours**	**Prerequisites**
1231.2322	Principles of Strategy	1.5	1	-
1231.2415	Business Ethics	1.5	1	-
1231.3011	Strategic Thinking 1	1.5	1	-
1231.3323	The Capital Market in Israel	1.5	1	Investment Theory and Security Analysis
1231.3332	Banking Management	1.5	1	Introduction to Finance and Engineering Economics
1231.3340	Financial Management	3	2	Introduction to Finance and Engineering Economics; Industrial and Cost Accounting
1231.3341	Investment Theory and Security Analysis	3	2	Introduction to Finance and Engineering Economics
1231.3344	Options and Futures	1.5	1	Investment Theory and Security Analysis
1231.3375	Behavioral Finance	1.5	1	Principles of Finance
1231.3401	Methods of Research in Markets and Organizations	1.5	1	Introduction to Marketing; Stochastic Models in Operations Research
1231.3402	Consumer Insights and Strategic Marketing	3	2	Marketing Management
1231.3406	Industrial Marketing (B2B)	1.5	1	Marketing Management
1231.3619	Strategic Management	1.5	1	Principles of Strategy
1231.3622	Industry Analysis	1.5	1	Principles of Strategy
1231.3922	Measuring Eco-Efficiency in Business Context	1.5	1	-
1231.3928	Development and Use of Patents as a Strategic Business Tool	1.5	1	-
1242.2203	Information Systems and Business Strategy	1.5	1	Principles of Information Systems

1242.2216	Information in Decision-Making Processes	1.5	1	Economics for Industrial Engineers
1242.2219	Managing the Information Resource	1.5	1	Principles of Information Systems; Economics for Industrial Engineers
1242.3248	Knowledge Data Discovery and Neural Networks	1.5	1	Statistics
1242.3259	Risk Management and New Business Models in the Cyber World	1.5	1	-
1242.3262	Sustainable Product Life Cycle Management	1.5	1	-
1242.3266	Networks, Crowds, and Markets	1.5	1	-
1243.3014	International Management 1	1.5	1	Organizational Behavior
1243.3015	Management of Teams	1.5	1	Organizational Behavior
1243.3125	Managing Negotiations	1.5	1	Organizational Behavior
1243.3542	Organizational Design	1.5	1	Organizational Behavior

4.2 – For students with a Bachelor's degree in other disciplines				
Course No.	**Course name**	**Credit points**	**Hours**	**Prerequisites**
1231.2212	Organizational Behavior for Business Administration	3	2	-
1231.2322	Principles of Strategy	1.5	1	-
1231.2410	Principles of Finance	3	2	Statistics
1231.2411	Management of Technology and Information	1.5	1	-
1231.2413	Marketing Management	3	2	Economics
1231.2415	Business Ethics	1.5	1	-
1231.3340	Financial Management	3	2	Principles of Finance; Accounting

Registration for courses at the School of Management is per available openings.

- A student may register for a maximum of three courses outside the curriculum, as approved by his permanent supervisor.

- A course outside the curriculum will be considered an elective course. A course outside the Faculty will receive credit points, as allocated by its home Department, and can count for up to 3 credit points at the Faculty of Engineering.
- Students with a B.Sc. in Industrial Engineering will select management courses from Section 4.1; Students with a BSc in other Disciplines will select management courses from Section 4.2.

Course No. Legend:
0571 – Industrial Engineering (Undergraduate)
0572 – Industrial Engineering (M.Sc. program)
0510 – School of Electrical Engineering
0540 – School of Mechanical Engineering
0368 – Computer Science
0365 – Dept. of Statistics
1231-1243 – School of Management