



Master program: BUSINESS ADMINISTRATION AND ENGINEERING in ENGLISH 2024-2025

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CONTENT OF THE LECTURES FROM THE STUDY PLAN

Ist YEAR

1st Year, 1st Semester, 2024-2026, active 2024-2025

Subject Code	DA/ DS/ DC	Year	Se m	Subject Name	E / V	C	S	L	P	ECTS
UPB.12.S.M1.I.101	DS	1	1	Industrial Marketing	E	1		1		4
UPB.12.S.M1.I.102	DS	1	1	Financial Management	E	2		1		4
UPB.12.A.M1.I.103	DA	1	1	Management of Information Systems	E	2		1		4
UPB.12.A.M1.I.104	DA	1	1	Event Driven Dynamic Systems	V	2		1		4
UPB.12.A.M1.I.105	DA	1	1	International Trade and Transactions	E	2		1		4
UPB.12.A.M1.I.106	DA	1	1	Research Practice I	V					10

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Industrial Marketing

The subject covers the following topics: 1. Defining the concept and scope of industrial marketing- From Marketing 1.0 to 6.0: Definitions, market, competition, customer etc., Industrial marketing. The industrial consumer, Classification of products and services, The role and place of marketing in business, 2. Industrial marketing information system- General information, Defining the problem and collecting relevant information, Identifying solutions; 3. Strategic planning- Stages of the strategic marketing planning process, Mission, objectives and organizational strategies, objectives and marketing strategies; 4. Methods and techniques used in environmental analysis, Internal environment analysis, Analysis of the competitive environment, Analysis of the macro environment, Analysis methods and techniques: BCG, GE, differentiation matrix, etc.; 5. Consumer behavior- Individual consumer behavior, Industrial consumer behavior; 6. The marketing mix - Product strategies, Product life cycle, The importance of product planning, Distribution strategies, Distribution channels on the industrial market, Distribution channels for goods and services for individual consumers, Price strategies, The price on the industrial market, The factors influencing the price, Promotion strategies,



Promotion of industrial products, .6. Advertising. Personal sales. Promotion of sales on the industrial market

Financial Management

The subject covers the following topics: 1. Accounting and Financial Statements and Cash Flow; 2. Financial Statements Analysis and Long-term Planning; 3. Discounted Cash Flow Valuation; 4. How to Value Bonds and Stocks; 5. Investment rules – Net Present Value, The Internal Rate of Return, The Average Accounting; Return Method, and the Profitability Index; 6. Risk Analysis – Sensitivity Analysis, Scenario Analysis, and Break-Even Analysis; 7. Short-Term Finance and Planning; 8. Long-Term Financing; 9. Capital Structure, and Cost of Capital; 10. Dividends and Other Payouts; 11. Options, Futures, and Corporate Finance; 12. Leasing; 13. Short-Term Finance and Planning; 14 Mergers and Acquisitions.

Management of Information Systems

The subject covers the following topics: 1. Basic concepts related to information systems ; 2. Types of management information systems (MIS); 3 Design / use / application development of MIS ; 4. Basic concepts of business process management and how it can be optimized by using ICT

Event Driven Dynamic Systems

The subject covers the following topics: 1. Dynamic Systems; Discrete Event Examples; Untimed DES; 2. Markov Chain Models; 3. Petri Nets ; 4. P/T Nets ; 5. Max - Plus Algebra Representation of DES; 6. Business Process Management; 7. Discrete Modeling and Simulation; 8. Discrete Simulation – Arena; 9. Discrete event systems and its applications- Game Theory; 10. Game Theory – Games in Economy; 11. Game Theory – Economy Structure; 12. Discrete event systems and its applications- Auctions; 13. Electronic Auctions and Games

International Trade and Transactions

The subject covers the following topics: 1. Introduction to international trade. Globalisation and free trade. The costs and benefits of globalisation. The costs and benefits of free trade. The role of developing countries in world trade. Recent trends and changes in the global economy; 2. Legal framework for international trade at national and international level. Foreign trade mechanism. Romania's trade policy. Tariff and non-tariff trade policy. Export stimulation and promotion; 3. Export strategy. Ways of doing business. Direct export - advantages and disadvantages. Main types of direct export. Indirect export - advantages and disadvantages. Main types of indirect export. Maximising profits: offshore companies and tax havens for companies and individuals; 4. The international commercial contract. Types of contracts. Characteristics of international contracts. Marking and packaging terms. Terms relating to the quality of goods. International delivery terms - INCOTERMS. International transport and logistics. Payment terms. Payment methods and instruments; 5. Multicultural contract negotiations. Inter- and intra-group negotiations. Profile of negotiators in multicultural contexts. Multicultural negotiating groups; 6. Risks in international business



transactions. Risk assessment and analysis. Risk index. Types of risks in international trade; 7. International business financing and investment. Transnational corporations. Financing techniques.

Research Practice I

Research Practice I gives students hands-on experience performing research, which is an essential ability for academic and professional development. Students choose a research topic that relates to their interests, assisted by a coordinating professor who guides them throughout the semester. This course culminates in the presentation of a research thesis, which often serves as the foundation for the student's Master's thesis topic. This approach teaches students key research methodologies, critical thinking abilities, and hands-on experience in academic inquiry, preparing them for future scholarly undertakings and professional challenges.

1st Year, 2nd Semester, 2024-2026, active 2024-2025

Subject Code	DA/ DS/ DC	Year	Sem	Subject Name	E/ V	C	S	L	P	ECTS
UPB.12.A.M2.I.101	DA	1	2	Strategic Management	E	2		1		5
UPB.12.S.M2.I.102	DS	1	2	Numerical Methods for Economic Systems	V	2		1		5
UPB.12.A.M2.I.103	DA	1	2	Data and Signal Processing for Business	E	2		1	1	5
UPB.12.A.M2.I.104	DA	1	2	Business Cultural Models and Diversity Management	E	2		2		5
UPB.12.A.M2.I.105	DA	1	2	Research Practice II	V					10

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Strategic Management

The subject covers the following topics: 1. The process of strategic management - Defining the business. Establishing strategic objectives. Formulating strategy; 2. Industry and competitive analysis. The firm's own situation - Industry structure; industry attractiveness, The Porter's Five Forces Model of Competition, SWOT analysis; 3. Business Strategies - Generic business strategies: strategy of low-cost, strategy of differentiation, focus and specialization strategy, Combinations of generic business strategies for different types of industry environments and competitive situations; 4. Building and defending Competitive Advantages - Achieving competitive advantage via low-cost, differentiation, and focus strategies, Pitfalls of generic strategies, Offensive and defensive strategies to protect competitive advantages; 5 Corporate Strategies - Concentration on a single business, The strategy of vertical integration, The strategy of diversification, Abandonment and liquidation strategies, Corporate turnaround, retrenchment, and portfolio restructuring strategies; 6. Techniques for Analyzing Corporate Diversification Strategies - BCG matrix, GE matrix; 7. Implementing strategy - Matching organization structure to strategy, functional organization structure, geographic forms of organization, decentralized business units, strategic business units; matrix forms of organization, Creating commitment, corporate culture, support systems, and leadership.



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Numerical Methods for Economic Systems

The subject covers the following topics: 1. Mathematical Modeling, Numerical Methods & Problem Solving; 2. MatLab Fundamentals; 3. Linear Systems (Gauss Elimination, LU factorization, Matrix Inverse, Iterative methods, Eigenvalues). Linear Systems in Economics; 4. Nonlinear Equations Solving and Optimization; 5. Optimization in Economics; 6. Curve fitting (Linear Regression, General Linear and Non-linear Least Squares Regression); 7. Integration and Differentiation; 8. Curve Fitting in Economics; 9. Ordinary Differential Equations; 10. Monte Carlo Simulation.

Data and Signal Processing for Business

The subject covers the following topics: 1. Signals and Data Analysis; 2. Python; 3. Probabilities and Statistics; 4. Models and Monte Carlo Simulation; 5. Ordinary Least Squares; 6. Economic models; 7. Dynamic economic models; 8. Econometrics; 9. Inferential Statistics; 10. Data and Signal Processing; 11. ARIMA, Box-Jenkins Methodology.

Business Cultural Models and Diversity Management

The subject covers the following topics: 1. Introductions, Course Overview, Theoretical Underpinnings of Diversity, Dimensions of Diversity; 2. Changing Demographics, Organizational Culture; 3. Organizational Structures & Systems; Policy & Practice; 4. Multiculturalism and barriers for global deal making; 5. Negotiation models, evaluating the models steps for preparing global deal making; 6. Principles for global negotiation; 7. Strategies for negotiation in international contracts; 8. American Business models. Working with Americans; 9. Latino American Business models. Working with Latino Americans; 10. Asian Business models. Working with Asians; 11. European Business models. Working with Europeans; 12. Mending international deals; 13. Inclusive Corporate Cultures.

Research Practice II

Research II expands on the basis created by Research I, allowing students to advance their thesis study via rigorous investigation and practical application. Building on their initial discoveries and approaches from Research I, students explore deeper into their chosen topic with the assistance of a faculty advisor, insisting on the theoretical side. This course focuses on the integration of theoretical insights and practical research, enabling students to develop their hypotheses, conduct detailed data analysis, and reach meaningful conclusions. By incorporating extra empirical work and scholarly exploration, Research II provides students with the advanced research skills required to bring novel insights to their field of study, preparing them for the completion of their Master's thesis and future academic or professional pursuits.



2nd YEAR

2nd Year, 1st Semester, 2023-2025, active 2024-2025

Subject Code	DA/ DS/ DC	Ye ar	Sem	Subject Name	E/ V	C	S	L	P	ECTS
UPB.12.S.M3.I.101	DS	2	1	Project Management	E	2		1		4
UPB.12.A.M3.I.102	DA	2	1	Prediction of System Evolution	V	2		1		5
UPB.12.A.M3.I.103	DA	2	1	Research Practice III	V					10
UPB.12.C.M3.I.104	DC	2	1	Ethics and Academic Integrity	V	1				2
Optional Subjects										
UPB.12.A.M3.O.101	DA	2	1	Technology Entrepreneurship	E	2		1	1	5
UPB.12.A.M3.O.102				Information and Communications Technology Entrepreneurship						
UPB.12.A.M3.O.103	DA	2	1	Modeling of Complex Systems	E	2		1		4
UPB.12.A.M3.O.104				Enterprise Management with SAP						

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Project Management

The subject covers the following topics: 1. Introduction to the course. Structure and contents. Grading system - Defining projects. Projects typology. Project vs. Organization; 2. Project lifecycle - Lifecycle stages. General environment of the EU-funded programmes and projects. PCM (Project Cycle Management). Ex-ante and ex-post evaluation ; 3. Project management principles - Principles. Concurrent and parallel engineering; 4. Logical Framework Approach (LFA) - Origins, steps: analysis and design steps; 5. Project matrix - Matrix elements. Indicators ; 6. Risk analysis - External factors. Risk analysis and management; 7. Project management - Project team, project management, and project manager, Project management cost; 8. Project monitoring - Monitoring procedures. Reporting. Monitoring cost; 9. Project budgeting - Cost of project activities and cost of the project. Project budget and financing, Project effectiveness, efficiency, durability and sustainability; 10. Project



implementation - Models and methods, Implementation plans. Diagrams (Gantt): activities, resources, cost, financing, Optimization (cost, time, resources). Specialized software for project management.

Prediction of System Evolution

The subject covers the following topics: 1. What is Artificial Intelligence. What is Machine Learning. The Data Mining Process; 2. Supervised Learning – Regression. Univariate Linear Regression. Multivariate Linear Regression. Model Selection and Validation. Model Diagnostics. Model Assumptions. Performance Criteria; 3. Supervised Learning – Classification. Support Vector Machines. Neural Networks. Decision Trees. Ensemble Methods. Performance Criteria. Example Applications; 4. Unsupervised Learning – Clustering. K-means Clustering. Agglomerative Hierarchical Clustering. Performance Criteria; 5. Unsupervised Learning – Dimensionality Reduction. Principal Component Analysis; 6. Unsupervised Learning – Anomaly Detection. Univariate Gaussian Distributions, Multivariate Gaussian Distributions; 7. Unsupervised Learning – Recommender Systems. Content Based Recommendation. Collaborative Filtering; 8. Unsupervised Learning – Social Network Analysis, Network and Graph Theory, Representing Social Networks, Quantitative Measures of Social Networks; 9. Reinforcement Learning. Markov Decision Process, Q-Learning, Policy Gradient, Applications.

Research Practice III

Research III continues the academic journey that began in Research I and was further enhanced in Research II, allowing the student to explore and advance their Master's thesis. This phase focuses on broadening the scope and depth of study by conducting rigorous investigations, practical experiments, and theoretical inquiries. Students go deeper into their selected topic, using sophisticated research approaches to gain fresh insights and improve their thesis. Working closely with a faculty advisor, they manage research problems, critically examine findings, and incorporate academic viewpoints into their work. Research III focuses on the practical, iterative nature of research, encouraging students to articulate innovative contributions, engage with current literature, and explain their growing research findings with clarity and precision.

Ethics and Academic Integrity

The subject covers the following topics: 1. Ethics, integrity, deontology – short presentation of the basic concepts in their evolution; 2. The relationship between society and scientists, from the perspective of respecting ethical principles. 3. Integrity of scientific research – plagiarism in all its forms, anti-plagiarism software and their features, intellectual property; 4. Documents, norms and other forms of legislation in support of academic ethics nationally and internationally; 5. Ethics in the engineering field, the main guidelines in writing scientific papers correctly; 6. Deontology of teamwork; 7. Guidelines in Ethical Writing of Master's Dissertation

OPTIONAL SUBJECTS – each year, the students choose A or B for each pack

O1A - Technology Entrepreneurship

The subject covers the following topics: 1. Introduction in and basics of Technology Entrepreneurship; 2. The Entrepreneurial process; 3. The 4 phases of Entrepreneurial Venture; 4. The Value of Failure; 5. The Business Plan; 6. Venture and Growth Capital; 7. Validating and Implementing a new business: The Four Steps to the Epiphany;



O1B - Information and Communications Technology Entrepreneurship

The subject covers the following topics: 1. Technology, Innovation and Entrepreneurship – Instruments for Growth and Wealth; 2. Technology-driven vs. Market-driven Innovation; 3. Innovation and Knowledge Driven Entrepreneurship; 4. Innovation and Technology Transfer for Business Development; 5. Entrepreneurial Initiatives (Star-ups, Spin-offs, MSMEs); 6. Entrepreneurial Discovery Process; 7. Technology Entrepreneurship, Competition and Target Market Selection; 8. Financing for Entrepreneurial Projects; 9. Product management; 10. Risk Management; 11. Intellectual Property and Legal Framework; 12. Industry 4.0 Integration ; 13. Digital Entrepreneurship; 14. Case studies – Guidance from Digital Entrepreneurs

O2A - Modeling of Complex Systems

The subject covers the following topics: 1. Introduction and objectives; 2. Phase transition between order and chaos; 3. Critical phenomena. Phase transitions. Power law. SOC; 4. Autocatalytic networks; 5. Genetic circuits and attractors of spontaneous order; 6. Genotype spaces and fitness landscapes. Diminishing returns.; 7. Design of organisms and artefacts through search of fitness landscapes; 8. Self-organization and tuning of economical and technological systems; 9. Self-organization and dynamics of companies, economies, and political systems.; 10. Self-sustained expansion and unfolding of technological frontiers; 11. Integration and formulation of principles of Complexity. Conclusions; 12 .Agent-based models.

O2B - Enterprise Management with SAP

The subject covers the following topics: 1. SAP system and its modules. Concepts and Architecture; 2. SAP Finance (FI/CO); 3. SAP Logistics (SD/MM); 4. Programming with SAP ABAP; 5. Analytics and Reporting with SAP BI; 6. Administration and access management. Security.

2nd Year, 2nd Semester, 2023-2025, active 2024-2025

Subject Code	DA/ DS/ DC	Ye ar	Sem	Subject Name	E / V	C	S	L	P	ECTS
UPB.12.A.M4.I.101	DA	2	2	Research, Research Practice and Disertation work	V					30

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Research, Research Practice and Disertation work

Research, Research Practice, and Disertation Work is the continuation of the research journey begun in Research I, II, and III. These stages advance students' research efforts, taking them to the completion of their Master's thesis. Research Practice hones students' research skills through hands-on experience, allowing them to use approaches learnt in earlier phases under the guidance of a faculty mentor. Disertation work is the culmination of this development, in which students consolidate their research findings, thoroughly evaluate data, and synthesize their contributions to the discipline. Together, these components ensure that students gain broad knowledge in their chosen study subject, allowing them to make an academic and impactful Master's thesis presentation.