

# STRATEGIC INFORMATION GOVERNANCE (ETED5E)

**Department of Information Technologies**  
Faculty of Economics and Management

<b>Lecturers:</b>	doc. Ing. Jiří Vaněk, Ph.D. Akshay Pottathil, Ph.D.
<b>Teaching period:</b>	Fall semester
<b>Subject level:</b>	Masters
<b>ECTS credit:</b>	5.0
<b>Assessment:</b>	written and oral
<b>Marking scale:</b>	4-point scale
<b>Contact hours:</b>	36

## **Objective and general description:**

The course offers insight into the innovative security management domain, emphasizing governance to understand the more significant impact on society. The topics explore the sub-domain categories with academic case studies, journal articles, current news, and emerging trends. The seminars lay a foundation for an academic evaluation and scientific analysis of global security governance, management, and application.

## **Lectures:**

1. Introduction to Global Strategy
2. Coercion, Deterrence, and Compellence
3. Cooperation, Collective Intelligence, Internal Conflict, and Peacekeeping
4. Contemporary Threats: From Global Terrorism to Pandemic Operations
5. Strategic Planning and Asset Protection
6. Broadening Access: Health, Environment, and Human Dynamics
7. Developing Strategic Programs and Disaster Recovery Plans
8. Maritime and Port Challenges
9. Event and Executive Protection
10. Threat Detection and Response
11. Role of data and technology
12. Accountability and Corruption

## **Study literature:**

1. Jacobs, Gabriele, et al. International security management: new solutions to complexity. Cham: Springer, 2021. Print.
2. Kay, Sean. Global security in the twenty-first century: the quest for power and the search for peace. Lanham, Maryland: Rowman & Littlefield, 2015. Print.
3. Lehto, Martti, and P Neittaanmäki. Cyber security: analytics, technology, and automation. Cham: Springer, 2015. Print.
4. Current Peer-Reviewed Articles, News Content, and Conference Presentations are implemented in the course.

**GEOSPATIAL INTELLIGENCE (ETEE1E)**

**Department of Information Technologies**  
Faculty of Economics and Management

<b>Lecturers:</b>	Akshay Pottathil, Ph.D. Ing. Miloš Ulman, Ph.D.
<b>Teaching period:</b>	Fall semester
<b>Subject level:</b>	Masters
<b>ECTS credit:</b>	5.0
<b>Assessment:</b>	written and oral
<b>Marking scale:</b>	4-point scale
<b>Contact hours:</b>	36

**Objective and general description:**

Geospatial Intelligence encompasses diverse missions and functions performed by various organizations on the local, state, federal, and international levels. This course offers an overview of the leading-edge activities utilizing information systems to enhance international security, disaster management, humanitarian assistance, intelligence gathering, and data fusion. The course provides a foundation for applied research efforts to engage public and private sector partners to test/model geospatial intelligence initiatives.

**Lectures:**

1. Introduction to Geospatial Intelligence
2. Role of Technology in Intelligence & Counterintelligence
3. Gaining Competitive Advantage Through Information Systems
4. Managing the Information Systems Infrastructure & Services
5. Enhancing Intelligence Using Geographic Information Systems
6. Detecting Patterns and Interests in the Internet of Things
7. Deep Sea to Space Force
8. Net-Centric Warfare and Information Dominance
9. Autonomous Machines: Rise of UAV and AUV
10. Decentralized Networks Non-Obvious Relationship Analysis
11. Unexploded Ordnance (UXO) and Threats to our Ecosystem
12. Port Security and Enforcement Challenges

**Study literature:**

1. Clark, Robert M. Geospatial intelligence: origins and evolution. Washington, DC: Georgetown University Press, 2020. Print.
2. Prunckun, Hank. Counterintelligence theory and practice. Lanham: Rowman & Littlefield, 2019. Print.
3. Dorman, Michael. Learning R for Geospatial Analysis, Packt Publishing, Limited, 2014. ProQuest Ebook Central, <https://ebookcentral-proquest-com.infozdroje.czu.cz/lib/czup/detail.action?docID=1911526>.
4. Current Peer-Reviewed Articles, News Content, and Conference Presentations are implemented in the course.

**TRADE AND SECURITY (EUEF5E)**

**Department of Trade and Finance**  
Faculty of Economics and Management

<b>Lecturers:</b>	doc. Ing. Lubomír Cívín, CSc., MBA, Herbert Ricardo, Ph.D. Olga Regnerová, Ph.D.
<b>Teaching period:</b>	Fall semester
<b>Subject level:</b>	Masters
<b>ECTS credit:</b>	5.0
<b>Assessment:</b>	written and oral
<b>Marking scale:</b>	4-point scale
<b>Contact hours:</b>	36

**Objective and general description:**

The course provides an overview of trade principles, particularly concerning current security threats to global trade. Many of the challenges in trade and security are explored within domestic and global perspectives to gain knowledge of the domain, strategy, planning, and execution. Practitioners' historical actions and roles are evaluated to offer models that can be projected, applied, and tested.

**Lectures:**

1. Initial Concepts, Background, and Overview
2. Risks and risk management in international trade
3. Commercial risks and the tools for their reduction
4. Financial risks and the tools for their reduction
5. Political risks and the tools for their reduction
6. Socio-cultural risks and the tools for their reduction
7. Operational risks and the tools for their reduction
8. Resilient Supply Chain
9. Trade regulations: Sanctions and embargoes
10. Illicit trade
11. Free Trade Zones and Agreements
12. Sustainability and Development

**Study literature:**

1. Klein, Matthew C., and Michael Pettis. Trade wars are class wars: how rising inequality distorts the global economy and threatens international peace. New Haven: Yale University Press, 2020. Print.
2. Biran, Michal, Jonathan Brack, and Francesca Fiaschetti. Along the Silk Roads in Mongol Eurasia, generals, merchants, intellectuals. Oakland, California: University of California Press, 2020. Print.
3. Pillsbury, Michael. The hundred-year marathon: China's secret strategy to replace America as the global superpower. New York: Henry Holt and Company, 2015. Print.
4. Current Peer-Reviewed Articles, News Content, and Conference Presentations are implemented in the course.

**STATISTICAL DATA ANALYSIS (ESE34E)****Department of Statistics**

Faculty of Economics and Management

<b>Lecturer:</b>	Ing. Tomáš Hlavsa, Ph.D.
<b>Teaching period:</b>	Fall semester
<b>Subject level:</b>	Masters
<b>ECTS credit:</b>	5.0
<b>Assessment:</b>	written and oral
<b>Marking scale:</b>	4-point scale
<b>Contact hours:</b>	36

**Objective and general description:**

The course synthesizes notions gained in statistical courses at the BSc level (Statistics and Statistical Software Systems) and expands those, especially in the multivariate data processing. The course aims to make students familiar with basic multivariate techniques. Emphasis is placed on choosing the appropriate method for the solution of the problem given, and the subsequent interpretation of the solution obtained.

**Lectures:**

1. Survey design, minimum necessary sample size assessment techniques, explorative analysis
2. Contingency table analysis
3. Enumerative data analysis
4. Ordinal data analysis
5. Basic of demography
6. Standard of living
7. Multiple regression and correlation - assumptions for application
8. Multiple regression and correlation - search for the optimum subset of explanatory variables
9. Multivariate statistical methods - principles and application
10. Principal component analysis
11. Factor analysis
12. Cluster analysis

**Seminars:**

Teaching is organized by way of lectures and seminars. The lectures pay more attention to the theory basics, and the seminars concentrate on applications. Students check and verify their theory knowledge on practical assignments (using statistical software SAS), and the correct interpretation of results obtained is carefully assessed. The Moodle System supports the teaching practice and students' work.

**Study literature:**

1. Delwiche, L. D., Slaughter, S. J. The Little SAS Book, SAS Publishing, Cary, NC, 2003. ISBN 978 1 59 047333 7.
2. Muller, K., Fetterman, B. Regression and ANOVA An Integrated Approach Using SAS Software, SAS Institute, 2012. ISBN 978 1580258906.
3. Rencher, A. Methods of Multivariate Analysis, Wiley Publishing, New York, 2002. ISBN 978 0 47 141889 4.
4. Chikkodi, C., M., Satyaprasa, B., G. 2010. Business Statistics. Global Media. ISBN 978-93-5024-331-2
5. Nisbert R., Elder, J., Miner, G. Handbook of statistical analysis and data mining applications, Academic Press, 2009. ISBN 978 0 12 374765 5.

**ICT FOR MANAGERS (ETED8E)**

**Department of Information Technologies**  
Faculty of Economics and Management

<b>Lecturers:</b>	doc. Ing. Edita Šilerová, Ph.D. Ing. Petr Benda, Ph.D.
<b>Teaching period:</b>	Fall semester
<b>Subject level:</b>	Masters
<b>ECTS credit:</b>	5.0
<b>Assessment:</b>	written and oral
<b>Marking scale:</b>	4-point scale
<b>Contact hours:</b>	36

**Objective and general description:**

The course aims to develop students' knowledge of new information and communication technologies and prepare the future economist - for their practical use, especially in their economic and managerial needs. The course responds to the development of ICT. It creates prerequisites for the effective use of these technologies in related professional subjects regarding current threats and the need to address them through security methods. In processing the semester project, students solve complex practical situations concerning their information systems.

**Lectures:**

1. Introduction to the subject - the importance of information for the economist
2. Development of information technologies
3. ICT for management and data analysis
4. ICT infrastructure and security
5. Internet technologies, their use, and security risks
6. WWW Technology principles and security issues
7. Data management, Real-world modeling
8. Data Mining, Big data, and its processing
9. Information systems architectures
10. IT management and standards (ITIL, COBIT), Cybersecurity standards
11. Introduction to Electronic Commerce and Internet marketing
12. Knowledge society

**Study literature:**

1. REYNOLDS, G. Information Technology for Managers. Cengage Learning, Inc, 2. ed., 2015. ISBN 9781305389830
2. IBRAHIEM, M. and EL EMARY, M. Shaping the Future of ICT: Trends in Information Technology, Communications Engineering, and Management. CRC Press, 2017. ISBN 978-135165129-5
3. DORAISWAMY, P. IT Project Management, 30 Steps to Success. IT Governance Publishing, 2011. ISBN 9781849281003
4. KRUG, S. Don't Make Me Think: Revisited. New Riders, 2014. ISBN 9780321965516
5. LOPEZ, J., ZHOU, J. and SORIANO, M. Computer Security - 23rd European Symposium on Research in Computer Security, ESORICS 2018, Barcelona, Spain, September 3-7, 2018, Proceedings. Switzerland, 2018. ISBN 9783319990729

**ESSENTIALS OF DIPLOMACY (EHEE3E)**

**Department of Humanities**  
Faculty of Economics and Management

<b>Lecturer:</b>	Daniel Swain, Ph.D.
<b>Teaching period:</b>	Fall semester
<b>Subject level:</b>	Masters
<b>ECTS credit:</b>	5.0
<b>Assessment:</b>	written and oral
<b>Marking scale:</b>	4-point scale
<b>Contact hours:</b>	36

**Objective and general description:**

The course covers all aspects of current diplomatic affairs in the European agricultural context, focusing on traditional forms of diplomacy (bilateral and multilateral relations) as well as on new forms of diplomacy (informal diplomacy in a global governance context, scientific diplomacy, digital diplomacy, paradiplomacy, climate diplomacy, cyber-diplomacy). Concerning the traditional forms of diplomacy, the main accent is laid on the Vienna Conventions on Diplomatic and Consular Relations combined with the analysis of research articles, respective policy papers, reports, and other primary sources. Students get solid knowledge about main diplomatic terms, such as diplomatic immunity, diplomatic protocol, diplomatic corps, international legal regulations, and conventions, which diplomatic practice follows, to the main tasks of diplomatic missions and how they are fulfilled. Students also get a basic overview of future career possibilities in diplomacy, public administration, and EU/international organizations.

**Lectures:**

1. Introduction. Definition of diplomacy. Historical overview of Diplomacy in a Global Governance Context. Theoretical concepts.
2. Forms of diplomacy. Conference diplomacy, Bilateral diplomacy, and Multilateral diplomacy.
3. Main types of diplomacy. Formal/informal diplomacy, Economic diplomacy in an agricultural trade context. Cultural and Public diplomacy. Paradiplomacy.
4. New forms of diplomacy (Digital diplomacy, Cyber-diplomacy, Scientific Diplomacy).
5. Conventions adapting diplomatic and consular relations.
6. Jus legationis. Diplomatic relations, their establishment, and interruption.
7. Diplomatic mission and its purpose. Multiple accreditations. Special missions.
8. Diplomatic corps. Head of the mission, members of the staff of the mission. Education of diplomats
9. Rights and immunity of diplomatic mission. Diplomatic correspondence.
10. Consuls and consulates. Diplomatic protocol.
11. Essentials of multilevel diplomacy, Diplomatic negotiations.
12. Essentials of foreign policy. International organizations.

**Study literature:**

1. ČMEJREK, J.; WURST-HAŠOVÁ, B.: Essentials of Diplomacy. Prague: CULS. 2012. 146 p. ISBN 978-80-213-2294-3.:
2. Vienna Convention on Diplomatic Relations. Done at Vienna on 18 April 1961.
3. Vienna Convention on Consular Relations. Done at Vienna on 24 April 1963.
4. BERRIDGE, G. R.: Diplomacy: Theory and Practice (2015)
5. BARSTON, R. P.: Modern Diplomacy. London: Routledge, 2014. ISBN 1-405-81201-X
6. BAYNE Nicholas a WOOLCOCK Stephen: The new economic diplomacy: decision making and negotiation in international economic relations. 3rd ed., revised and updated. Farnham: Ashgate, 2011. ISBN 978-1-4094-2541-0
7. KISSINGER, H.: Diplomacy (1995)
8. NYE, Joseph S. Soft Power: The Means to Success in World Politics. New York: Public Affairs, 2004.
9. A global actor in search of a strategy: European Union foreign policy between multilateralism and bilateralism. European Commission - Directorate-General for Research and Innovation, Publications Office of the EU, 2014, ISBN: 978-92-79-36550-8, available at: <https://op.europa.eu/en/publication-detail/-/publication/9a9a379d-48dc-4758-aa16-990f3e39e2f4#>
10. BARRINHA, André, RENARD, Thomas (2017): Cyber-diplomacy: the making of an international society in the digital age, Global Affairs, 3:4-5, 353-364, DOI: 10.1080/23340460.2017.1414924

**INFORMATION SYSTEM SECURITY (ETED6E)**

**Department of Information Technologies**  
Faculty of Economics and Management

<b>Lecturers:</b>	doc. Ing. Jiří Vaněk, Ph.D. Ing. Martin Havránek, Ph.D.
<b>Teaching period:</b>	Spring semester
<b>Subject level:</b>	Masters
<b>ECTS credit:</b>	5.0
<b>Assessment:</b>	written and oral
<b>Marking scale:</b>	4-point scale
<b>Contact hours:</b>	36

**Objective and general description:**

The main goal is to get an overview of current security trends, safety management, and evaluation of the impact of security incidents on business informatics.

**Lectures:**

1. Basic concepts of security
2. Security management
3. Cryptography and its use in IS
4. Hash functions, asymmetric cryptography, certificates, and CAs
5. Safety of local networks, intranets
6. VPN, extranets safety
7. Authentication in IS
8. Risk analysis, threats, and precautions
9. Safety audit, security law
10. Financial aspects of computer security, primary and secondary assets
11. Protection of data against unauthorized access
12. Safety in the enterprise - emergency plans, crisis scenarios

**Study literature:**

1. Jacobs, Gabriele, et al. International security management: new solutions to complexity. Cham: Springer, 2021. Print.
2. Kay, Sean. Global security in the twenty-first century: the quest for power and the search for peace. Lanham, Maryland: Rowman & Littlefield, 2015. Print.
3. Lehto, Martti, and P Neittaanmäki. Cyber security: analytics, technology, and automation. Cham: Springer, 2015. Print.
4. Current Peer-Reviewed Articles, News Content, and Conference Presentations are implemented in the course.

**GEOGRAPHIC INFORMATION SYSTEMS (EIEE1E)**

**Department of Information Engineering**  
Faculty of Economics and Management

<b>Lecturer:</b>	Ing. Jakub Konopásek, PhD..
<b>Teaching period:</b>	Spring semester
<b>Subject level:</b>	Masters
<b>ECTS credit:</b>	5.0
<b>Assessment:</b>	written and oral
<b>Marking scale:</b>	4-point scale
<b>Contact hours:</b>	36

**Objective and general description:**

The course is focused on the technology of geographical modeling and analysis of spatial data and then using resulting spatial data in web applications. The aim is to make available to students the theoretical and software apparatus that allows them to solve requirements in spatial planning, land inventory, and land management and use the possibilities of GIS modeling for investment planning, address marketing, optimization of services, etc. Students will publish their findings to the GIS server and the world wide web.

**Lectures:**

1. Geographic Information System – theory and application
2. Sources and methods of data acquisition. Spatial information
3. Basic models of spatial data
4. Cartographic representations, reference body, methods of projection
5. Queries by location and attribute, working with vector data
6. Geoprocessing – geospatial analysis (extract, overlay, proximity),
7. Geoprocessing – statistics, geocoding
8. Geoprocessing – basic methods of image processing, georeferencing
9. Geoprocessing – classification of image data
10. GPS navigation system, new social challenges
11. Galileo, the European geographical area
12. Publication, sharing, web maps, story maps, application areas

**Study literature:**

1. Klimešová D. GIS Technology courses, textbook PEF CULS Prague, 2004. Lectures with many links are available at moodle.czu.cz
2. Write D. J., Harder Ch. GIS for Science, ESRI PRESS, 2019, ISBN: 9781589485303.  
Brimicombe A. (2010). GIS, Environmental Modeling and Engineering, CRC Press, Taylor & Francis Group.  
Sangpradid S. Change Vector Analysis using Integrate Vegetation Indices for Land Cover Change Detection, International Journal of Geoinformatics, Vol. 14, No. 4, 2018.
3. Marr, B. (2016). How V.R. will Revolutionize Big Data Visualization. Forbes Online (May 4, 2016).
4. Farkas, D., Hilton, B., Pick, J., Ramakrishna, H., Sarkar, A., & Shin, N. (2016). A tutorial on geographic information systems: A ten-year update. Communications of the Association for Information Systems, 38(1), 9.
5. Scientific journals: Applied Geomatics, Journal of Geosciences and Geomatics, International Journal of Advanced Research and Publications, Remote sensing.

**HEALTH AND ENVIRONMENT (EEE2DE)****Department of Economics**

Faculty of Economics and Management

<b>Lecturers:</b>	prof. Ing. Mansoor Maitah, Ph.D. et Ph.D. doc. Ing. Petr Procházka, MSc., Ph.D.
<b>Teaching period:</b>	Spring semester
<b>Subject level:</b>	Masters
<b>ECTS credit:</b>	5.0
<b>Assessment:</b>	written and oral
<b>Marking scale:</b>	4-point scale
<b>Contact hours:</b>	36

**Objective and general description:**

The course teaches topics relevant to understanding the impacts of climate change, food security, public health, and environmental issues on the economic activities of organizations and society. Teaching will be done through lectures and seminars, analysis and discussions over research papers and case studies. Students will also participate in a one-week study block with a visiting professor.

**Lectures:**

1. Introduction to Environmental Health
2. Sustainable development goals
3. Waste Management
4. Infectious Diseases and Public health
5. Water and Sanitation
6. Global Food Resources
7. Climate and Environment
8. Emerging Threats: Trend and Pattern Recognition
9. Conservation
10. Air Pollution
11. External Threats: Biodiversity and Ecology
12. Internal Threats: Genotoxins and Carcinogenic Process

**Study literature:**

1. Adenle, Ademola A., et al. Science, technology, and innovation for sustainable development goals: insights from agriculture, health, environment, and energy. New York, NY: Oxford University Press, 2020. Print.
2. Quinlan, Heather. Plagues, pandemics, and viruses: from the plague of Athens to COVID-19. Canton, MI: Visible Ink Press, 2020. Print.
3. Raven, Peter H., et al. Environment. Hoboken: Wiley, 2015. Print
4. Current peer-reviewed articles, news content, and conference presentations are implemented in the course.

**APPLIED INNOVATION (ERE4FE)**

**Department of Management**  
Faculty of Economics and Management

<b>Lecturer:</b>	doc. Ing. Ladislav Pilař, Ph.D., MBA
<b>Teaching period:</b>	Spring semester
<b>Subject level:</b>	Masters
<b>ECTS credit:</b>	5.0
<b>Assessment:</b>	written and oral
<b>Marking scale:</b>	4-point scale
<b>Contact hours:</b>	36

**Objective and general description:**

The course is focused on expanding and deepening the knowledge of master's students about the urgency of implementing and continuous improvement of new concepts of system management of innovation (change) in the organization. Following current world trends of modern management and the attributes of turbulent times, which significantly affect the internal and external business environment, the practical part of the course focuses on clarifying the critical factors of success in managing innovation (change) in organizations. Following the definition of the difference between change and innovation, the theoretical concept of "innovation constraints" is used for innovation, which combines knowledge from academic research and business practice. Therefore, innovation management is based on a wide range of modern management techniques, which students are introduced to within the course.

**Lectures:**

1. The theoretical concept of Innovation Management. The nature of innovation and why manage innovation?
2. Basic typology of innovations
3. Innovation barriers - 6 primary innovation constraints; Personal constraints
4. Individual constraints- Employee Silence; Personal initiative.
5. Group constraints- Corporate culture; Leadership.
6. Business constraints- Business Strategies, Organizational structure, Business resources.
7. Innovation strategies
8. Business process improvement
9. Innovation opportunities
10. Evaluation of innovations
11. Kaizen
12. Innovation trends

**Study literature:**

1. Christensen, T. (2015). *The Creativity Challenge: Design, Experiment, Test, Innovate, Build, Create, Inspire, and Unleash Your Genius*. Adams Media.
2. Kaufman, J. C., & Sternberg, R. J. (2021). *Creativity: An Introduction*. Cambridge University Press.
3. Schilling, M. (2019). *Strategic Management of Technological Innovation* (6th ed.). McGraw-Hill Education.
4. Tidd, J., & Bessant, J. R. (2014). *Strategic Innovation Management* (1st ed.). Wiley.
5. Martin, K. (2018). *Learner-Centered Innovation: Spark Curiosity, Ignite Passion, and Unleash Genius*. Impress.
6. Oakes, K. (2021). *Culture Renovation: 18 Leadership Actions to Build an Unshakeable Company* (1st ed.). McGraw-Hill Education.

**THE STRATEGY OF INFORMATION SYSTEM (ETEE2E)**

**Department of Information Technologies**  
Faculty of Economics and Management

<b>Lecturers:</b>	doc. Ing. Edita Šilerová, Ph.D. Ing. Miloš Ulman, Ph.D
<b>Teaching period:</b>	Fall semester
<b>Subject level:</b>	Masters
<b>ECTS credit:</b>	5.0
<b>Assessment:</b>	written and oral
<b>Marking scale:</b>	4-point scale
<b>Contact hours:</b>	36

**Objective and general description:**

This course deals with the principles of information systems and the relationship between the global business strategy and the company's information strategy. Particular attention is paid to the relationship between information systems and the strategic layer of enterprise management. Mini case studies illustrate approaches to solving problems associated with information systems from the strategic management perspective.

**Lectures:**

1. Human & Information, Information in business practice
2. Strategy of organization
3. Interactions of Business Model and IT Strategy,
4. Examples of Successful Business Models and IT Strategies
5. Building a strategy in cooperation with IS development
6. Management system and organization information system
7. A systemic view of organizations, the phenomenon of informatics
8. Technological progress versus Business Practice
9. Requirements for IS and Business Intelligence
10. Challenges and Risks of Emerging Technologies

**Study literature:**

1. McKeen, J. D., Smith, H. A. (2018). IT Strategy & Innovation. 4th edition. Prospect Press. ISBN: 9781943153442
2. Ross, J. W., Beath, C. M., & Sebastian, I. M. (2017). How to develop a great digital strategy. MIT Sloan Management Review, 58(2), 7.
3. Queiroz, M., Tallon, P., Coltman, T., & Sharma, R. (2020, January). Digital Infrastructure, Business Unit Competitiveness, and Firm Performance Growth: The Moderating Effects of Business Unit IT Autonomy. In Proceedings of the 53rd Hawaii International Conference on System Sciences.
4. Current Peer-Reviewed Articles, News Content, and Conference Presentations are implemented in the course.

**KNOWLEDGE ANALYTICS (ETEE3E)**

**Department of Information Technologies**  
Faculty of Economics and Management

<b>Lecturers:</b>	Ing. Miloš Ulman, Ph.D. Hemant Purohit, Ph.D.
<b>Teaching period:</b>	Fall semester
<b>Subject level:</b>	Masters
<b>ECTS credit:</b>	5.0
<b>Assessment:</b>	written and oral
<b>Marking scale:</b>	4-point scale
<b>Contact hours:</b>	36

**Objective and general description:**

This course prepares information professionals on basic concepts to understand and analyze the design of information systems. The course material focuses on key conceptual questions about information, such as the difference between information and knowledge, how data management contributes to organizational memory, and the boundaries in representing and processing information for humans and machines. The course presents basic techniques to extract knowledge, organize, and interact with information through basic visualization interfaces.

**Lectures:**

1. Historical Multidisciplinary Perspective on Information and Information Systems
2. Data-Information-Knowledge-Wisdom (DIKW) Model
3. Information Representation Biases in Analytics Process
4. Human Information Processing Theory and Human-Computer Interaction
5. Machine Information Processing: Data Storage
6. The managerial perspective of organizational memory
7. Data modeling and SQL
8. Knowledge Discovery: Types of Systems for Mining Patterns
9. Knowledge Discovery: Structured Representation and Data Preprocessing
10. Knowledge Discovery: Analytics with Association Rules
11. Knowledge Discovery: Analytics with Clustering Methods
12. Knowledge Discovery and Visualization tools

**Study literature:**

1. Han, J., Pei, J., & Kamber, M. (2011). Data mining: Concepts and techniques. ProQuest Ebook Central <https://ebookcentral-proquest-com.infozdroje.czu.cz>
2. Watson. R. (2016). Data Management. Databases and organizations. 6th edition. Prospect Press or Kindle version on Amazon.
3. Skiena, S. S. (2017). The data science design manual. Springer.
4. Current academic papers, tutorials, and specific book chapters will be implemented in the course.

**ECONOMIC IMPACTS OF CONFLICT AND VIOLENCE (EEE2EE)**

**Department of Economics**  
Faculty of Economics and Management

<b>Lecturer:</b>	prof. Ing. Mansoor Maitah, Ph.D. et Ph.D.
<b>Teaching period:</b>	Fall semester
<b>Subject level:</b>	Masters
<b>ECTS credit:</b>	5.0
<b>Assessment:</b>	written and oral
<b>Marking scale:</b>	4-point scale
<b>Contact hours:</b>	36

**Objective and general description:**

The course examines the role of Conflict and Violence as a de-evolutionary, tearing at the fabric of society. The impact studies model how such policies can destroy the total sum of a country's productive efforts, including taking away humanitarian efforts for its citizens. The notion that a Conflict can force a false economy by directing the focus of a country's gross production on war and defense, taking away the country's ability to provide for the common good, are examples of case studies within the course framework. These seminars offer insight into the unintended consequences, good and bad, of violence in society.

**Lectures:**

1. Introduction to Conflict and Violence
2. Conflicts, past, present, and the future
3. World Economy- Micro Perspective
4. World Economy- Macro Perspective
5. Low-Intensity Conflict (LIC) - The Causes and effect
6. LIC - Impact on the Government and Citizens
7. General War - The Causes and effect
8. General War - Impact on the Government and Citizens
9. Lawlessness and Disorder
10. Predictive Indicators
11. Leadership and Governance in Crisis
12. The Ultimate Cost

**Study literature:**

5. Calderon, C., Kambou, G., Korman, V., Kubota, M., & Cantu Canales, C. (2019). Africa's Pulse, No. 19, April 2019: An Analysis of Issues Shaping Africa's Economic Future. The World Bank.
6. World Bank. (2019). Governing Infrastructure Regulators in Fragile Environments: Principles and Implementation Manual.
7. Kara, Siddharth. Modern slavery: a global perspective. New York: Columbia University Press, 2017. Print.
8. Current peer-reviewed articles, news content, and conference presentations are implemented in the course.

**DATA MINING (ESED1E)**

**Department of Statistics**  
Faculty of Economics and Management

<b>Lecturer:</b>	Ing. Jana Köppelová, Ph.D.
<b>Teaching period:</b>	Fall semester
<b>Subject level:</b>	Masters
<b>ECTS credit:</b>	5.0
<b>Assessment:</b>	written and oral
<b>Marking scale:</b>	4-point scale
<b>Contact hours:</b>	36

**Objective and general description:**

Graduates will acquire comprehensive knowledge of statistical methods for obtaining information from extensive databases. They are thoroughly acquainted with data mining procedures implemented in current versions of statistical software SAS Base or SAS Enterprise Miner, or SAS Viya. Graduates can analyze the available data graphically, further, edit to improve subsequent analyses, assemble predictive models (e.g., decision trees, regression models), compare and interpret complex models, perform cluster segmentation or association and sequential analysis, or generate and apply Scoring code.

**Lectures:**

1. Basic principles and techniques of processing large data files.
2. Principles of work in SAS Base, SAS Data Miner, and SAS Viya
3. Types and sources of data. Selection of data for modeling. Data preparation before modeling.
4. Basic computer and graphic techniques of exploratory data analysis.
5. Description in Data Mining (Cluster analysis).
6. Description in Data Mining (Principal component analysis).
7. Prediction in Data Mining: Regression analysis (Linear regression).
8. Prediction in Data Mining: Regression models with categorical variables, Logistic regression method.
9. Prediction in Data Mining: Methods of selection variables and their reduction.
10. Prediction in Data Mining: Use the decision tree.
11. Credit Scoring.
12. Prediction time series models. Identification, estimation, and verification of time series models.

**Study literature:**

1. BHARATI, Mrs; RAMAGERI, M. Data mining techniques and applications. 2010.
2. FENG, Zhenni; ZHU, Yanmin. A survey on trajectory data mining: Techniques and applications. *IEEE Access*, 2016, 4: 2056-2067.
3. JIROUŠEK, Radim a Václav KRATOCHVÍL, ed. Discrete compositional models for data mining. Prague: Matfyzpress, 2019. ISBN 978-80-7378-404-1
4. MUCHERINO, Antonio; PAPAJOJGI, Petraq; PARDALOS, Panos M. Data mining in agriculture. Springer Science & Business Media, 2009.
5. NISBET, Robert; ELDER, John; MINER, Gary. Handbook of statistical analysis and data mining applications. Academic Press, 2009.
6. ROKACH, Lior; MAIMON, Oded Z. Data mining with decision trees: theory and applications. World Scientific, 2008.
7. ZOU, Hailei. Clustering Algorithm and Its Application in Data Mining. *Wireless Personal Communications*, 2020, 110.1: 21-30.

**SELF-AWARE CITIES (ETEE4E)**

**Department of Information Technologies**  
Faculty of Economics and Management

<b>Lecturer:</b>	Ing. Miloš Ulman, Ph.D.
<b>Teaching period:</b>	Fall semester
<b>Subject level:</b>	Masters
<b>ECTS credit:</b>	5.0
<b>Assessment:</b>	written and oral
<b>Marking scale:</b>	4-point scale
<b>Contact hours:</b>	36

**Objective and general description:**

Information and communication technology has been becoming an indispensable component of every city. Self-aware cities use connected technology to support transportation, health management, energy management, and other vital city functions. Planning, designing, and implementing the digital infrastructure of a self-aware city is a complex task that requires both knowledge of the latest smart city technology and its capabilities and an understanding of information system planning and management. This allows for gathering information on ongoing developments that would not be possible to have insight into. Special attention will be paid to the last-mile management systems often lacking in city transportation.

**Lectures:**

1. The Smart City Phenomenon
2. Role of innovative technologies
3. Information management in Connected Environments
4. Program and project management in City planning and Operations
5. Enterprise Architecture and its frameworks
6. ICT in enterprise architecture and digital transformation
7. Benefits of digital transformation - preparation, risks, and execution.
8. Use of agile and waterfall approach in digital transformation
9. The continuous evolution of digital transformation
10. Sensors and the Internet of Things
11. Shifting behavior: Autonomy in Automobiles to Refrigerators
12. The risk of cutting-edge frameworks and backward compatibility

**Study literature:**

1. Song, H., Srinivasan, R., Sookoor, T., Jeschke, S., & Jeschke, S. (2017). Smart cities: Foundations, principles, and applications. ProQuest Ebook Central <https://ebookcentral-proquest-com.infozdroje.czu.cz>
2. Seghrouchni, A. E. F., Ishikawa, F., Hérault, L., Tokuda, H., & Hérault, L. (Eds.). (2016). Enablers for smart cities. ProQuest Ebook Central <https://ebookcentral-proquest-com.infozdroje.czu.cz>
3. Leignel, J., Ungaro, T., & Staar, A. (2016). Digital transformation: Information system governance. ProQuest Ebook Central <https://ebookcentral-proquest-com.infozdroje.czu.cz>
4. Current Peer-Reviewed Articles, News Content, and Conference Presentations are implemented in the course.

**CONTINUITY OF OPERATIONS (ETEE5E)****Department of Information Technologies**  
Faculty of Economics and Management

<b>Lecturers:</b>	Akshay Pottathil, Ph.D. Ing. Martin Havránek, Ph.D.
<b>Teaching period:</b>	Spring semester
<b>Subject level:</b>	Masters
<b>ECTS credit:</b>	4
<b>Assessment:</b>	written and oral
<b>Marking scale:</b>	4-point scale
<b>Contact hours:</b>	30

**Objective and general description:**

This course prepares professionals for worst-case scenarios by creating a business impact analysis, business continuity plan, and disaster recovery. Seminars introduce business continuity management principles, including identifying risks, threats, and vulnerabilities. The ability to mitigate threats and create a deterrence is explored from cyber security infrastructure to physical infrastructure.

**Lectures:**

1. Introduction to organizational responsibilities and operations
2. Theory and Practice of Operational Continuity
3. Understanding the Organizational Context
4. Building Relationships Within and Across Organizations
5. External Teams and Distributed Networks
6. Hazard Vulnerability Assessments
7. Global Security Operations Centers (GSOC), Public-Private Partnerships
8. Crisis Communication
9. Managed Security Services
10. Hazard Vulnerability Assessments; Stakeholder Impact and Return on Investment

**Study literature:**

1. Phillips, Brenda D. Business continuity planning: increasing workplace resilience to disasters. Amsterdam: Butterworth-Heinemann, 2020. Print.
2. Calder, Alan. ISO22301: 2019 - An introduction to a business continuity management system (BCMS). City: IT Governance Publishing, 2020. Print.
3. Wallace, Michael, and Lawrence Webber. The disaster recovery handbook: a step-by-step plan to ensure business continuity and protect vital operations, facilities, and assets. New York: AMACOM, 2018. Print.
4. Current Peer-Reviewed Articles, News Content, and Conference Presentations are implemented in the course.

**DATA VISUALIZATION (ETEE6E)**

**Department of Information Technologies**  
Faculty of Economics and Management

<b>Lecturers:</b>	Ing. Jan Masner, Ph.D. Hemant Purohit, Ph.D.
<b>Teaching period:</b>	Spring semester
<b>Subject level:</b>	Masters
<b>ECTS credit:</b>	4
<b>Assessment:</b>	written and oral
<b>Marking scale:</b>	4-point scale
<b>Contact hours:</b>	30

**Objective and general description:**

The course explores technical and analytical issues, solutions, and gaps in processing large volumes of data by leveraging effective visualization techniques. The goal is to find relevant intelligence or knowledge for an application in an industry/domain (e.g., healthcare, finance, national intelligence, or disaster response) with limited decision-making time. The course teaches hands-on skills in data visualization and information interfaces.

**Lectures:**

1. Introduction to Data Visualization
2. Input for Visualization: Data and Tasks
3. Industry Practices and Applications of Data Visualization
4. Enterprise Data Management and Visual Analytics
5. Information Interfaces for Data Analytics Solutions
6. Techniques of Spatial Visual Analytics
7. Multivariate and Geospatial displays
8. Location Intelligence: Contact Tracing
9. Distributed Data Processing
10. Big Data Applications and Visualization

**Study literature:**

1. Miller, J. D. (2017). Big data visualization. ProQuest Ebook Central <https://ebookcentral-proquest-com.infozdroje.czu.cz>
2. Leskovec, J., Rajaraman, A., & Ullman, J. D. (2014). Mining of massive datasets. Cambridge University Press. Website: <http://www.mmids.org/#book>
3. Watson, R. (2016). Data Management. Databases and organizations. 6th edition. Prospect Press or Kindle version on Amazon.
4. Current academic papers, tutorials, and specific book chapters will be implemented in the course.

**BORDERS AND CUSTOMS (EUEF6E)**

**Department of Trade and Finance**  
Faculty of Economics and Management

<b>Lecturers:</b>	Ing. Lukáš Moravec, Ph.D. Ing. Gabriela Kukalová, Ph.D., MBA, Ing. Jan Rohan, Ph.D. Akshay Pottathil, Ph.D.
<b>Teaching period:</b>	Spring semester
<b>Subject level:</b>	Masters
<b>ECTS credit:</b>	4
<b>Assessment:</b>	written and oral
<b>Marking scale:</b>	4-point scale
<b>Contact hours:</b>	30

**Objective and general description:**

The students will get acquainted with the purpose and significance of borders and customs for national economies. The course presents current trends in international taxation, sheds light on the impact of tax policy on trade and investment in the global world economy, and discusses how borders present challenges to a region in its attempt to protect its citizens, sovereignty, and resources.

During the lectures, students will be able to meet leading experts from organizations such as Borderpol, Interpol, World Customs Organization, Regional Customs, Organization for Security and Cooperation in Europe (OSCE), the Ministry of Finance of the Czech Republic, the General Financial Directorate of the Czech Republic and large consulting companies.

**Lectures:**

1. Corporate taxation. The trend of international taxation.
2. Tax specifics of international trade and investment - general legal framework. Double taxation.
3. Tax residence. Treaties eliminating double taxation. Double non-taxation prevention.
4. EU tax principles and directives.
5. GAAR, SAAR. Digital economy taxation.
6. Border's importance for economies around the world
7. Transnational Crimes, Illicit Trade, and flow of commodities. Role of Cryptocurrency and Digital Technology
8. Customs and Border/Law Enforcement Agencies
9. The cost to humanity: Cross Border Human Trafficking. Migration and its impact
10. Cross-border health issues

**Study literature:**

1. LANG, M.2018. Introduction to European Tax Law on Direct Taxation. 5th ed. Wien: Linde. ISBN 978-3-7073-3846-1.
2. BENSMAN, TODD. AMERICAS COVERT BORDER WAR: the untold story of the nation's battle to prevent jihadist... infiltration. S.l: BOMBARDIER BOOKS, 2021. Print.
3. Sanchez, Gabriella E. Human smuggling and border crossings. London, New York: Routledge/Taylor & Francis Group, 2015. Print.
4. Roy, Rohatgi. 2018. On International Taxation - Volume 1: Principles. Amsterdam: IBFD, ISBN 978-90-8722-494-3
5. Current peer-reviewed articles, news content, and conference presentations are implemented in the course.

**SYSTEMS INTEGRATION (EIEE2E)**

**Department of Information Engineering**  
Faculty of Economics and Management

<b>Lecturers:</b>	doc. Ing. Václav Vostrovský, Ph.D. Ing. Martin Pelikán, Ph.D.
<b>Teaching period:</b>	Spring semester
<b>Subject level:</b>	Masters
<b>ECTS credit:</b>	4
<b>Assessment:</b>	written and oral
<b>Marking scale:</b>	4-point scale
<b>Contact hours:</b>	30

**Objective and general description:**

This course aims to acquaint students with the basic principles of system integration and expand their knowledge of ICT and information systems' role in the decision-making and management of modern economic entities. The course contains a general overview of the analysis of problems related to information security, the necessary technical means for their solution, and the architectures of information systems. The course describes and critically analyzes the various tools for system integration. Students of this course will gain the knowledge needed to develop information system architectures, their operation, and the individual steps of the system integrator.

**Lectures:**

1. Introduction to system integration, basic terminology
2. Global and information strategy of the company
3. IS / IT system life cycle and project life cycle
4. System integration, integration platforms
5. CI / CD processes - continuous integration and continuous deployment
6. System specification and analysis of the requirements of the contracting authority and the end-user
7. Analysis and design of the system, implementation, system testing, commissioning, maintenance
8. An economic evaluation of system integration, integration plan
9. Methods and approaches of quality assessment of IS / I system, ISO 9000+
10. New trends in system integration

**Study literature:**

1. GRADY, Jeffrey O.: System Integration, 2nd Edition, CRC- Press 2014, ISBN 978-0-367-44945-2.
2. MYERSON Judith M.: Enterprise Systems Integration, 2st Edition, A CRC Press Company 2010, ISBN 0-893-1149-7.
3. Reviewed journal of the Czech Society for System Integration (ČSSI): <http://www.si-journal.org/index.php/JSI/index>
4. ČSN ISO / IEC 12207
5. ISO/IEC 9126 Software quality characteristics and metrics
6. Fundamentals for lectures +sample of the credit test and written exam in Moodle

# Compulsory optional courses – Group 1

## **PROGRAMMING IN PYTHON (ETED9E)**

### **Department of Information Technologies**

Faculty of Economics and Management

<b>Lecturers:</b>	Ing. Michal Stočes, Ph.D. Ing. Jan Pavlík
<b>Teaching period:</b>	Spring semester
<b>Subject level:</b>	Masters
<b>ECTS credit:</b>	5
<b>Assessment:</b>	written and oral
<b>Marking scale:</b>	4-point scale
<b>Contact hours:</b>	36

### **Objective and general description:**

The course develops a basic knowledge of algorithm development using their practical application in the Python programming language. After familiarizing themselves with the basic principles of the language and the development environment, the student solves the assigned tasks by creating structured programs individually or with the teacher's assistance. Students enhance their technological skills to develop interactive and error-resistant programs. The course mainly covers all the necessary basics of Python programming and delves into more specialized areas according to the study program.

### **Lectures:**

1. Python basics.
2. Basic data types and variables.
3. Selection, iteration.
4. Complex data types – strings, arrays.
5. Complex data types – collections (sets, lists, tuples, and dictionaries).
6. Files, input/output.
7. Functions.
8. Objects.
9. Error handling and debugging.
10. Advanced properties of functions, objects, and classes.
11. Selected modules, packages, and libraries – depending on the study program.
12. Summary, example project.

**Study literature:**

1. Matthes, E. Python Crash Course: A Hands-On, Project-Based Introduction to Programming. No Starch Press, 2015. ISBN 978-1-59327-603-4.
2. Martelli, A. Python in a Nutshell. O'Reilly Media, 2006. ISBN 0-596-10046-9.
3. Pilgrim, M. Dive into Python 3. APress Media, 2009. ISBN 978-1430224150.
4. Neceise, Rance D. Data Structures and Algorithms Using Python. John Wiley & Sons, Inc, 2011. ISBN 978-0470618295
5. Beazley, D., Jones, B. K. Python Cookbook. O'Reilly Media, 2013. ISBN 978-1449340377.

**DECISION SUPPORT SYSTEMS (EAEG4E)**

**Department of Systems Engineering**  
Faculty of Economics and Management

<b>Lecturer:</b>	prof. RNDr. Helena Brožová, CSc.
<b>Teaching period:</b>	Spring semester
<b>Subject level:</b>	Masters
<b>ECTS credit:</b>	5
<b>Assessment:</b>	written and oral
<b>Marking scale:</b>	4-point scale
<b>Contact hours:</b>	36

**Objective and general description:**

The course aims to show the basic concepts of decision support systems. It deals with the characteristics of the whole area and focuses mainly on the relationship between systems theory, the decision-making process, and decision support. The theory is supplemented by historical development and examples of DSS. The relationship between DSS and other information and knowledge systems is also shown. Students apply the acquired knowledge in a semester project describing and analyzing the design of a suitable DSS for solving problems in their thesis.

**Lectures:**

1. Selected topics from Systems Science and Systems Theory
2. Development of DSS and historical applications of DSS
3. Examples of practical DSS applications
4. Decision-making process
5. Decision-making process and DSS
6. Properties and categorization of DSS
7. DSS structure and architecture
8. Model-driven DSS, De Novo programming, Evolutionary algorithms
9. Knowledge-driven DSS, knowledge maps
10. Data and documents-driven DSS
11. Communication-driven DSS
12. DSS and other information systems

**Study literature:**

1. Power, D. J.: Decision Support Basics, Business Expert Press, 2009
2. Power, D. J.: Decision Support Systems – Concepts and Resources for Management, Quorum Books, Westport, Connecticut, 2002
3. Scott Morton, M. S.: Management Decision Systems; Computer-Based Support for Decision Making, Harvard Univ. Press, Boston 1971
4. Power, D.J., Sharda, R.: Decision Support Systems, Springer, 2009
5. Power, D. J.: Decision Support Systems: Frequently Asked Questions, iUniverse Publishing, 2004
6. Turban, E., Aronson, J.E., Liang, T.P.: Decision Support Systems and Intelligent Systems, Prentice Hall, 2001.
7. Bosch, O., Nguyen, N., Van Nguyen, T.: Systems Thinking for Everyone: The journey from theory to making an impact, Kindle Edition, Malik International AG, St. Gallen, Switzerland; 3rd Edition, 2019 1449340377.

**HUMAN RESOURCE MANAGEMENT (ERE4GE)**

**Department of Management**  
Faculty of Economics and Management

<b>Lecturer:</b>	doc. Ing. Martina Fejfarová, Ph.D.
<b>Teaching period:</b>	Spring semester
<b>Subject level:</b>	Masters
<b>ECTS credit:</b>	5
<b>Assessment:</b>	written and oral
<b>Marking scale:</b>	4-point scale
<b>Contact hours:</b>	36

**Objective and general description:**

The goal of the course is to acquire knowledge of human resource management and H.R. activities of a manager and to obtain knowledge and skills in areas like the labor market, recruitment and selection, adaptation, motivation, performance management, training and development, career management, employee mobility, and human resource management perspectives. The primary forms of teaching include lectures and seminars oriented on practicing some skills and cultivating opinions during individual and team tasks and case studies solutions.

**Lectures:**

1. Human Resource Management in the 21st Century: Challenges for the Future
2. Labour Market
3. Recruitment
4. Selection
5. New Employee Adaptation
6. Motivation and Employee Engagement
7. Reward Management
8. Performance Management
9. Training and Development
10. Career Management
11. Employee Mobility
12. Human Resource Management Perspectives

**Study literature:**

1. ARMSTRONG, M., TAYLOR, S. Armstrong's handbook of human resource management practice. 15th Edition. Philadelphia, PA: Kogan Page, 2020. ISBN 978-0749498276.
2. LUSSIER, R. N., HENDON, J. R. Human resource management: functions, applications, & skill development. 3rd Edition. Los Angeles: SAGE, 2017. ISBN 978-1-5443-2106-6.
3. MATHIS, R. L., JACKSON, J. H., VALENTINE, S. R., MEGLICH, P. Human Resource Management. 15th Edition. Andover, United Kingdom: Cengage Learning, 2016. ISBN 978-1305500709.
4. PINK, D. H. Drive: the surprising truth about what motivates us. New York: Riverhead Books, 2011. ISBN 1594484805.
5. SNELL, S., MORRIS, S., BOHLANDER, G. Managing human resources. 18th Edition. Andover, United Kingdom: Cengage Learning, 2018. ISBN 978-1337389624.
6. TED Talks available at [www.ted.com](http://www.ted.com)

**ARTIFICIAL INTELLIGENCE (EIEE3E)****Department of Information Engineering**  
Faculty of Economics and Management

<b>Lecturer:</b>	doc. Ing. Arnošt Veselý, CSc.
<b>Teaching period:</b>	Spring semester
<b>Subject level:</b>	Masters
<b>ECTS credit:</b>	5
<b>Assessment:</b>	written and oral
<b>Marking scale:</b>	4-point scale
<b>Contact hours:</b>	36

**Objective and general description:**

The course aims to introduce students to modern parts of artificial intelligence, also called soft computing or computational intelligence, that comprise neural networks, evolutionary algorithms, and fuzzy systems. Graduates will be able to apply their expertise in creatively solving new problems. They will be able to identify situations and problems that artificial intelligence methods should solve, design their effective solutions and then implement them using professional software.

**Lectures:**

1. Introduction to artificial intelligence
2. Neuron model
3. Learning a neuron
4. Layered networks
5. Learning of layered networks, backdrop algorithm
6. Application of layered networks
7. Hopfield networks and their applications
8. Competition networks and their applications
9. Evolutionary algorithms
10. Fuzzy sets and relations
11. Fuzzy modeling
12. Fuzzy systems

**Study literature:**

1. Rajasekaran S. Neural Networks, Fuzzy Logic, and Genetic Algorithms, 2017, ISBN 978-81-203-5334-3
2. Veselý A.: Artificial intelligence, <https://moodle.czu.cz>.
3. Engelbrecht A. P.: Computational Intelligence, John Wiley, 2007
4. Bishop Ch. M.: Pattern Recognition and Machine Learning, Springer, 2006

# Compulsory optional courses – Group 2

## INTERNATIONAL ECONOMICS (ENEC7E)

### Department of Economic Theories

Faculty of Economics and Management

<b>Lecturers:</b>	doc. Ing. Alexandr Soukup, CSc. Oldřich Ludwig Dittrich, MPH, Ph.D. Ing. David Křížek
<b>Teaching period:</b>	Spring semester
<b>Subject level:</b>	Masters
<b>ECTS credit:</b>	4
<b>Assessment:</b>	written and oral
<b>Marking scale:</b>	4-point scale
<b>Contact hours:</b>	30

### Objective and general description:

This course introduces models of international trade and applies the theory to analyze gains from trade, a pattern of trade, protectionism, the balance of payments, exchange rate determination, international policy coordination, and international labor and capital markets. The lectures highlight basic theoretical concepts related to international economics. Theoretical concepts are then applied in seminars, where the students discuss issues from different areas of international economics in participative ways.

The student must participate in contact teaching to be eligible for the written exam. If the student misses more than 30% of classes without an accountable explanation, she/he is not eligible to take the exam till she/he complies with additional requirements. The student must also write an essay on a topic selected by the lecturer. The final test combines a multiple-choice test and problem solving. The multiply choice test checks the basic knowledge of the students. Problem solving requires students to demonstrate their judgments, communication, and argumentation competencies. The total points are converted into grading used at CULS through the ECTS grading procedure.

### Lectures:

1. World trade: An Overview. Gravity model. The changing pattern of world trade.
2. Labor Productivity and Comparative Advantage. A one-factor economy Trade in a one-factor world. World relative supply and demand. Relative wages.
3. Resources, Comparative Advantage, and Income Distribution. Two-factor economy. Effect of International trade between two-factor economies Trade and the distribution of income. Good and factor price equalization. Trade and income distribution in the short run.

4. Standard trade model. Production possibilities and relative supply. Determining relative prices. The effect of growth. The shift in RS curve Effect of international transfers of income. Shifting the RD curve. Tariffs and export subsidies. Shifting RS and RD
5. Economies of Scale, Imperfect Competition, and International Trade. Monopolistic competition and trade. Economic of scale and comparative advantage. Intra-industry trade and internal/external economies of scale. Welfare effect.
6. International Factor Movements. International labor movement. International capital movement. International borrowing and lending. Direct foreign investment. Multinational Enterprise.
7. Instruments of Trade Policy. Tariffs, subsidies, and quotas Welfare effect. Other trade policy instruments. VER, local content requirements. Large and small countries' effect of policy instruments.
8. The Political Economy of Trade Policy. Arguments for free trade. Welfare arguments against free trade. Domestic market failure argument against free trade. The theory of second best. International negotiations and trade policy. WTO, free trade area, a customs union.
9. Trade Policy in Developing Countries. Import substitution. The infant industry argument Export-driven industrialization
10. Controversies in Trade Policies. Arguments for activist trade policy. Imperfect competition and strategic trade policy. The anti-globalization movement. Labor standards, environmental and cultural issues

### **Study literature:**

1. KRUGMAN, P. R.; OBSTFELD, M.; International Economics: Theory and Policy, London: Pearson Prentice Hall, 2018. ISBN 978-0134520995.
2. SPRINKLE, R. L.; SAWYER, CH, W. International economics. London: Pearson Prentice Hall, 2009. ISBN 978-0132089975.
3. HANNAN, S. A. The Impact of trade agreements: New approach, new insights. International Monetary Fund, 2016. ISBN 978-1484386521.
4. GRAVELLE, H.; REES, R. Microeconomics. London: Prentice Hall, 2004. ISBN 0-582-02386-6.
5. ROMER, D. Advanced macroeconomics. New York: McGraw-Hill, 2012. ISBN 978-0-07-351137-5.
6. BLANCHARD, O.; JOHNSON, D.R. Macroeconomics. Boston: Pearson, 2017. ISBN 9780133837995.
7. JEHLE, G.; RENY, P. Advanced Microeconomic Theory. New York: Prentice Hall, 2011. ISBN 978-0-273-73191-7.
8. PINDYCK, RS; RUBINFELD, D.L. Microeconomics. Boston: Pearson, 2013. ISBN 978-0132870436.
9. MANKIW, N. G. Principles of Macroeconomics. Toronto: Thomson Nelson, 2008. 880 p. ISBN 978-1285165875

**FOREIGN POLICY AND INTERNATIONAL RELATIONS (EHEE4E)**

**Department of Humanities**  
Faculty of Economics and Management

<b>Lecturer:</b>	Daniel Swain, Ph.D.
<b>Teaching period:</b>	Spring semester
<b>Subject level:</b>	Masters
<b>ECTS credit:</b>	4
<b>Assessment:</b>	written and oral
<b>Marking scale:</b>	4-point scale
<b>Contact hours:</b>	30

**Objective and general description:**

The course deals with the main theoretical approaches to international relations studies on one side; on the other, it covers practical aspects of foreign policy. Students are provided with a solid overview of main International Relations theories, especially those connected to the EU establishment and enlargement/integration, as well as those which reflect the current international situation in the context of Global Governance (Dependency Theory, World Systems theory, Global Inequality). In order to understand essential principles and issues of the European Agenda, significant emphasis is given to the analysis of the functioning and coordination mechanisms of central decision-making institutions of the EU, including analysis of principal strategies (e.g., the Green Deal). Students are introduced to the main goals and instruments of Foreign Policy while investigating concrete states and their Foreign Policy Concepts based on the case study principle. Finally, students are encouraged to critically evaluate the recent development of International Organizations, with a particular accent on security and cyber threats issues, understand the rise of new phenomena and actors of international relations in the context of Global Governance as well, and understand global socioeconomic problems of contemporary international society.

**Lectures:**

1. EU affairs in geopolitical context – general introduction
2. Central decision-making bodies of the EU (European Commission, European Parliament, Council of the EU) – description, main functions, mechanisms, and working bodies, particularly regarding agriculture and development problems. Origins of EU integration, EU integration theories, Enlargement x Exit (Brexit)
3. Foreign Policy: definition, goals, tools/instruments, actors; Foreign Policy of the EU – European External Action Service
4. The Power of Small Nation Foreign Policy in the 21st Century (case studies of Switzerland, Singapore, and the Czech Republic); Middle Power Foreign Policy – a case study of Canada and the "niche diplomacy "; Superpower Foreign Policy – the USA and the Doctrines
5. Fundamental IR Theories (Realistic approach to international relations; Liberal approach to international relations; Scientific approach to international relations; Critical approach to international relations)
6. World Systems theory, Dependency Theory, Global Inequality

7. International Institutions; International Organizations; International Regimes; Systems of cooperation between states. Global Governance, Non-state actors in IR
8. Regional Powers, New powers of the Global South, BRICS
9. UN Agenda for Sustainable Development 2030 in the EU context; Development cooperation and its perceptions by selected international organizations (Triangular Cooperation, South-South Cooperation, South-North Cooperation) – comparison EU, OECD, U.N.
10. Global Challenges in contemporary international relations, focusing on cyber threats.

**Study literature:**

1. Jackson, Robert, Sorensen, Georg, Moller, Jorgen: Introduction to International Relations: Theories and Approaches. Seventh Edition. Oxford University Press, 2018
2. Kissinger, Henry: The World Order, Penguin Books Limited, 2014
3. Nye, Joseph S. Jr. and Donahue John D. (eds.): Governance in a Globalizing World. Washington, DC: Brookings Institution Press, 2000
4. Lopez-Claros, A., Dahl, A., & Groff, M. (2020). Global Governance and the Emergence of Global Institutions for the 21st Century. Cambridge: Cambridge University Press. doi:10.1017/9781108569293
5. von Braun, J., and Birner, R. (2017), Designing Global Governance for Agricultural Development and Food and Nutrition Security. *Rev Dev Econ*, 21: 265-284. doi:10.1111/rode.12261
6. Hurd, I. (2017). International Organizations: Politics, Law, Practice (3rd ed.). Cambridge: Cambridge University Press. doi:10.1017/9781316869604
7. Langhorner, R.: The Essentials of Global Politics, Hodder Arnold, 2006
8. Alden, C., Aran, A. (2012). Foreign Policy Analysis. London: Routledge, <https://doi.org/10.4324/9780203640999>
9. Bradford, Anu, The Brussels Effect. How the European Union Rules the World. Oxford University Press, 2020, DOI:10.1093/oso/9780190088583.001.0001
10. Hooghe, L., & Marks, G. (2009). A Postfunctionalist Theory of European Integration: From Permissive Consensus to Constraining Dissensus. *British Journal of Political Science*, 39(1), 1-23. doi:10.1017/S0007123408000409

**BIG DATA (ETEE7E)**

**Department of Information Technologies**  
Faculty of Economics and Management

<b>Lecturers:</b>	Ing. Jan Masner, Ph.D. Ing. Michal Stočes, Ph.D.
<b>Teaching period:</b>	Spring semester
<b>Subject level:</b>	Masters
<b>ECTS credit:</b>	4
<b>Assessment:</b>	written and oral
<b>Marking scale:</b>	4-point scale
<b>Contact hours:</b>	30

**Objective and general description:**

Data processing is an integral part of today's life. Modern society produces ever-increasing volumes, which need to be stored and analyzed efficiently. The course thematically focuses on storing, processing, and analyzing structured and unstructured data. It puts the knowledge of databases, statistics, programming, and other fields into context. Graduates will gain theoretical and practical knowledge of data storage and processing principles focusing on large volumes. In the practical part of the course, it is possible to use the Laboratory of Artificial Intelligence and Big Data Processing, where powerful PCs and access to the Hadoop cluster and specialized software are available.

**Lectures:**

1. Introduction, definitions, properties, types of data, classification
2. Systems for cluster computing
3. Hardware resources, cluster architecture
4. File systems and distributed data storage
5. Hadoop framework
6. Big data platforms
7. Programming for Big data
8. Database technologies
9. Data visualization and presentation
10. Public data sources and open data

**Study literature:**

1. GHAVAMI, Peter, 2019. Big data analytics methods: analytics techniques in data mining, deep learning, and natural language processing. 1 st Boston: DE GRUYTER. ISBN 9781547417957.
2. GORELIK, Alex, 2019. The enterprise big data lake: delivering the promise of big data and data science. Sebastopol, California: O'Reilly Media. ISBN 1491931558.
3. LEE, James, Tao WEI a Suresh Kumar MUKHIYA, 2018. Hands-on big data modeling: effective database design techniques for data architects and business intelligence professionals. ISBN 9781788620901.
4. DASGUPTA, Nataraj, 2018. Practical big data analytics: hands-on techniques to implement enterprise analytics and machine learning using Hadoop, Spark, NoSQL, and R. ISBN 9781783554393.
5. STRENGTHOLT, Piethein, 2020. Data Management At Scale. Sebastopol, California: O'Reilly Media. ISBN 978-1492054788.
6. HEALY, Kieran, 2018. Data visualization: a practical introduction. Princeton, NJ: Princeton University Press. ISBN 9780691181615.
7. MUELLER, John Paul a Luca MASSARON, 2019. Data Science Programming: All-in-One For Dummies. For Dummies. ISBN 978-1119626114.
8. ANKAM, Venkat, 2016. Big Data Analytics. Packt Publishing. ISBN 1785884697.

## **IMPLEMENTATION OF COMPUTER VISION AND ARTIFICIAL INTELLIGENCE SOLUTIONS IN JAVA (EIEE4E)**

**Department of Information Engineering**  
Faculty of Economics and Management

<b>Lecturer:</b>	Ing. Josef Pavlíček Ph.D.
<b>Teaching period:</b>	Spring semester
<b>Subject level:</b>	Masters
<b>ECTS credit:</b>	4
<b>Assessment:</b>	written and oral
<b>Marking scale:</b>	4-point scale
<b>Contact hours:</b>	30

### **Objective and general description:**

The course aims to acquaint students with selected technologies of the Java programming language. The prerequisite for passing the subject is knowledge of algorithms, web services protocols, and the basics of artificial intelligence. The student will go through designing, assembling, and implementing an application using artificial intelligence and machine vision technologies during the semester.

### **Lectures:**

1. Application build
2. Spring Framework I
3. Relational database: JDBC
4. Relational database: ORM
5. RESTful web services
6. Apps deployment on the Application Server
7. Computer vision fundamentals in Java
8. Working with images in Java
9. Artificial intelligence tools I
10. Artificial intelligence tools II, sample project

### **Study literature:**

1. The slide decks and study materials
2. Bruce Eckel, Thinking in Java, Pearson Education (U.S.), 10 Feb 2006, ISBN:10 0131872486
3. Cay Horstmann, Core Java Volume I--Fundamentals, 1, Pearson Education (U.S.), 13th October 2008, ISBN: 9780135166307
4. Joshua Bloch, Effective Java, Pearson Education (U.S.), 2018, ISBN: 0134685997