Critical Infrastructure in a Special Context: Analysis of Water Security and Supply Challenges in Africa
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Critical Infrastructure in a Special Context: Analysis of Water Security and Supply Challenges in Africa**	Credit value: 6
Course responsible and lecturer (name, academic title): Dr. Peter Gergo Juhasz, PhD	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 100% theory	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes. **Methods and (specific) approaches, characteristics used to deliver the course content:** Classroom lectures, case presentations and case studies, participation in project work (article writing).	
Form of assessment (exam / practical grade / other): Additional (specific) methods of knowledge assessment: The student has the opportunity to publish in the English-language, international journal operated by the African Research Institute of the Doctoral School of Security Studies (Journal of Central and Eastern European African Studies/JCEEAS)	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): -	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
Course Description: This course examines the critical role of water in Africa and the complex challenges associated with water supply and security in various regions and facilities, including refugee camps. Students will gain an understanding of the historical and contemporary development efforts in the continent, assessing both their successes and failures. Emphasis is placed on exploring innovative technical and technological solutions, with active engagement of African partner organizations and experts, to enhance water security and optimize water supply systems. **Learning Objectives:** By the end of the course, students will be able to:	

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1. Analyze the hydrographic, climatic, and topographical factors influencing water availability in Africa.
2. Evaluate traditional and contemporary methods of water supply and management.
3. Assess the impacts of modernization, urbanization, agriculture, and natural resource exploitation on water resources.
4. Examine the role of water scarcity in migration and regional stability.
5. Identify and critique local and international initiatives aimed at improving water security.
6. Contribute to development-focused projects by proposing feasible solutions in collaboration with partner organizations.

Course Topics:

- Hydrographic characteristics of Africa
- Challenges posed by varying climates and topography
- Traditional water supply methods
- Irrigation practices and their sustainability
- Transportation and water logistics
- Fishing and aquaculture management
- Water storage and preservation techniques
- Issues arising from urbanization, deforestation, and agricultural expansion
- Water scarcity as a driver of migration
- Wastewater treatment challenges in critical regions
- Local and international development initiatives
- Student contributions to practical development projects
- Case Study: Democratic Republic of the Congo
- Case Study: Malawi

2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

- Tünde Anna Kovács, Igor Fürstner: Critical Infrastructure Protection: Advanced Technologies for Crisis Prevention and Response, Cham, Springer Nature, 2025, ISBN: 9789402423082, 339 oldal.
- Tünde Anna Kovács, Zoltán Nyikes, Tamás Berek, Norbert Daruka, László Tóth: Critical Infrastructure Protection in the Light of the Armed Conflicts, Cham, Springer Nature, 2024, ISBN: 9783031479908, 534 oldal.

Critical Infrastructure in a Special Context: Analysis of Water Security and Supply Challenges in Africa
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

- Ryan K. Baggett, Brian K. Simpkins: Homeland Security and Critical Infrastructure Protection, 2nd Edition,Santa Barbara, California, ABC-CLIO, 2018, ISBN: 9798216098744, 432 oldal.
- Veress, S. J., Juhász, P. G., & Szeremley, C.: Food Security of Region around Nyangezi in Eastern Congo and Lake Bunyonyi in Uganda. Journal of Central and Eastern European African Studies, 2023, Vol. 3, No. 4., ISSN: 2786-1902, 130-144. oldal
- Juhász, P. G., & Szeremley, C.: Work of a Local NGO VETO, in Contrast with the International Organisations in the Eastern Congo. *Journal of Central and Eastern European African Studies*, 2023, Vol. *3*, No. 3., ISSN: 2786-1902, 18-39. oldal

2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

- Szeremley, C., & Juhász, P. G.: The DNS educational system as a device helping to prevent the spread of radicalisation in Malawi. *Journal of Central and Eastern European African Studies*, 2021, Vol. *1 No.* 3, ISSN: 2786-1902, 119-134. oldal
- Tampu, S., & Juhasz, P. G.: Clean water in the slums of East Africa. *Insights into Regional Development*, 2022, Vol. *4, No.* 3, ISSN 2669-0195, 34-47. oldal

Date: Budapest, 01. 09. 2025.

Prepared by:

Dr Peter Gergo Juhasz

A Special Variant of Critical Infrastructure: Food Safety and Food Security in the Differently Endowed Regions of Africa
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **A Special Variant of Critical Infrastructure: Food Safety and Food Security in the Differently Endowed Regions of Africa**	Credit value: 6
Course responsible and lecturer (name, academic title): Dr. Peter Gergo Juhasz, PhD	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 100% theory	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes. **Methods and (specific) approaches, characteristics used to deliver the course content:** Classroom lectures, case presentations and case studies, participation in project work (article writing).	
Form of assessment (exam / practical grade / other): Additional (specific) methods of knowledge assessment: The student has the opportunity to publish in the English-language, international journal operated by the African Research Institute of the Doctoral School of Security Studies (Journal of Central and Eastern European African Studies/JCEEAS)	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): -	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
The course aims to provide students with an understanding of the underlying causes of food-related challenges on the African continent, with particular emphasis on the differences resulting from the diverse characteristics of individual countries and regions. Students will: • gain insight into the food security situation of African countries and the factors behind regional disparities,	

A Special Variant of Critical Infrastructure: Food Safety and Food Security in the Differently Endowed Regions of Africa
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

- examine the impacts (and in many cases the failures) of previous development efforts,
- explore the potential of new technical and technological solutions for enhancing food supply and food security,
- analyze in detail the interconnections and interactions between extreme poverty, radicalization, armed conflicts, food security, and migration.

2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

- Tünde Anna Kovács, Igor Fürstner: Critical Infrastructure Protection: Advanced Technologies for Crisis Prevention and Response, Cham, Springer Nature, 2025, ISBN: 9789402423082, 339 oldal.
- Tünde Anna Kovács, Zoltán Nyikes, Tamás Berek, Norbert Daruka, László Tóth: Critical Infrastructure Protection in the Light of the Armed Conflicts, Cham, Springer Nature, 2024, ISBN: 9783031479908, 534 oldal.
- Ryan K. Baggett, Brian K. Simpkins: Homeland Security and Critical Infrastructure Protection, 2nd Edition,Santa Barbara, California, ABC-CLIO, 2018, ISBN: 9798216098744, 432 oldal.
- Veress, S. J., Juhász, P. G., & Szeremley, C.: Food Security of Region around Nyangezi in Eastern Congo and Lake Bunyonyi in Uganda. Journal of Central and Eastern European African Studies, 2023, Vol. 3, No. 4., ISSN: 2786-1902, 130-144. oldal
- Juhász, P. G., & Szeremley, C.: Work of a Local NGO VETO, in Contrast with the International Organisations in the Eastern Congo. *Journal of Central and Eastern European African Studies*, 2023, Vol. *3*, No. 3., ISSN: 2786-1902, 18-39. oldal

2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

- Szeremley, C., & Juhász, P. G.: The DNS educational system as a device helping to prevent the spread of radicalisation in Malawi. *Journal of Central and Eastern European African Studies*, 2021, Vol. *1 No.* 3, ISSN: 2786-1902, 119-134. oldal
- Tampu, S., & Juhasz, P. G.: Clean water in the slums of East Africa. *Insights into Regional Development*, 2022, Vol. *4, No.* 3, ISSN 2669-0195, 34-47. oldal

Date: Budapest, 01. 09. 2025.

Prepared by:

Dr Peter Gergo Juhasz

Africa in light of the international organisations COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Africa in light of the international organisations**	Credit value: 6
Course responsible and lecturer (name, academic title): Dr. Dávid Vogel PhD	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 100% - 0% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** Review of literature review and theoretical background, case presentations, case study analyses, critical current case examination, debate.	
Form of assessment (exam / practical grade / other): Additional (specific) methods of knowledge assessment: -	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): (*typically there are none!*) none	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- The primary goal of the subject 'Africa in light of the international organisations' is to give an overview to the students about the role the international (regional) organisations play in linking Africa to the World and about the position Africa has in the international community. - There is a special focus on the South-South Cooperation. - Students will gain a broader knowledge about the former and current African regional organisations and the specifics of the relationship between the continent and Hungary (based on the common memberships in international organisations).	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Reinalda, B., & Louis, M. (Eds.). (2025). *Routledge Handbook of International Organization*. Routledge, 698 pages, ISBN 9781032540696, https://doi.org/10.4324/9781003428138 - Balogun, E., Mwaba, A.K. (2023). African Union Reform: Challenges and Opportunities. In: Hare, P.W., Manfredi-Sánchez, J.L., Weisbrode, K. (Eds.) *The Palgrave Handbook of Diplomatic Reform and Innovation. Studies in Diplomacy and International Relations*. pp 277–294, Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-031-10971-3_13.	

Africa in light of the international organisations COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

- Stapel, S. (2022). *Regional Organizations and Democracy, human rights, and the rule of law: The African Union, Organization of American States, and the diffusion of institutions.* Palgrave Macmillan. 349 pages, ISBN 9783030903978, https://doi.org/10.1007/978-3-030-90398-5.
- Reynolds, J. T., Gilbert, E. T. (2011). *Africa in World History: From Prehistory to the Present*. Pearson. 416 pages. ISBN 9780205053995.
- Fredland, R. (1990). *A guide to African International Organizations*. Hans Zell Pub, 324 pages, ISBN 9780905450902.

2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

- Müller, L. M. (2024). *The Rise of a Regional Institution in Africa Agency and Policy-Formation within the ECOWAS Commission.* Routledge, 184 pages, ISBN 9781032133089, https://doi.org/10.4324/9781003228547.
- Saleem, A. K. (2023). *United Nations Peace Operations in Africa Civil-Military Coordination and State-Building*. Routledge India, 214 pages, ISBN 9781032230467, https://doi.org/10.4324/9781003275404.
- Bandeira Jerónimo, M., & Pedro Monteiro, J. (2020). International Organizations in Colonial Africa. *Oxford Research Encyclopedia of African History*. https://doi.org/10.1093/acrefore/9780190277734.013.440.
- Wilson, Z. (2006). *The United Nations and Democracy in Africa (Studies in International Relations).* Routledge. 268 pages. ISBN 978-1593102340
- Macqueen, N. (2002). *United Nations Peacekeeping in Africa Since 1960.* Routledge. 328 pages. ISBN 9780582382534.
- Söderbaum, F. (1996). *Handbook of Regional Organizations in Africa*. Nordic Africa Institute, 165 pages. ISBN 9789771064008.

Date: Budapest, 05.09. 2025

Prepared by:

David Vogel

AFRICAN CONFLICTS
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **African conflicts**	Credit value: 6
Course responsible and lecturer (name, academic title): Prod. Dr. János Besenyő	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 100% theory	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** Classroom lectures, case presentations and case studies, participation in project work (article writing).	
Form of assessment (exam / practical grade / other): Additional (specific) methods of knowledge assessment: The student has the opportunity to publish in the English-language, international journal operated by the African Research Institute of the Doctoral School of Security Studies (Journal of Central and Eastern European African Studies/JCEEAS)	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): -	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- To introduce students to the conflicts taking place on the African continent, their causes, forms of manifestation, functioning and the domestic, regional and international responses to them. - To present the conflicts and forms of warfare before the colonial period, their impact on African societies. - To present the conflicts of the colonial period, their actors and their effects on the international and African scene. - To present the conflicts that emerged after the colonial system, the interests and roles of domestic and international actors.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Evert Kleynhans, Marco Wyss: The Handbook of African Defence and Armed Forces, Oxford University Press, 2025, ISBN: 9780198884750, 896 pages. - János Besenyő, Korotayev Andrey, Issaev Leonid: Terrorism and Political Contention: New Perspectives on North Africa and the Sahel Region, Cham, Switzerland, Springer Nature Switzerland, 2024, ISBN: 9783031534294, 418 pages.	

- Besenyő János, Khanyile Moses B., Vogel David: Terrorism and Counter-Terrorism in Modern Sub-Saharan Africa, Cham, Switzerland, Springer Nature Switzerland, 2024, ISBN: 9783031566738, 300 pages.
- Moosa Elayah, Bakeel Alzandani: Conflicts in the Middle East and Africa: State, Non-State Actors and Unheard Voices, New York, Taylor & Francis, 2024, ISBN: 9781003854814, 190 pages.
- Carlson Anyangwe: Contemporary Wars and Conflicts Over Land and Water in Africa, Lanham, Lexington Books, 2024, ISBN: 9781666910377, 350 pages.
- Eeben Barlow: The War for Africa: Conflict, Crime, Corruption, and Foreign Interests, South Africa, 30 Degrees South Publishers, 2024, ISBN: 9781928359906, 524 pages.
- Festus B. Aboagya: Indigenous African Warfare, Accra, Ghana, Ulinzi Africa Resources, 2016, ISBN: 9789964721480, 539 pages.

2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

- Marco Jowell: Peacekeeping in Africa: Politics, Security and the Failure of Foreign Military Assistance, I.B.Tauris, 2018, ISBN: 9781786723413, 288 pages.
- Cedric De Coning, Linnéa Gelot, John Karlsrud: The Future of African Peace Operations: From the Janjaweed to Boko Haram, London, Zed Books Ltd., 2016, ISBN: 9781783607105, 170 pages.
- Joachim Koops, Norrie MacQueen, Thierry Tardy, Paul D. Williams: The Oxford Handbook of United Nations Peacekeeping Operations, Oxford University Press, 2015, ISBN: 9780191509544, 800 pages.
- Isiaka Badmus: The African Union's Role in Peacekeeping: Building on Lessons Learned from Security Operations, Cham, Springer, 2015, ISBN: 9781137426611, 277 pages
- Marco Wyss, Thierry Tardy: Peacekeeping in Africa: The evolving security architecture, New York, Routledge, 2014, ISBN: 9781317913672, 272 pages.
- Norrie Macqueen: United Nations Peacekeeping in Africa Since 1960, New York, Routledge, 2014, ISBN: 9781317877349, 328 pages.

Date: 14.08.2025.

Prepared by:

Prof. Dr. János Besenyő

African economies
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **African economies**	Credit value: 6
Course responsible and lecturer (name, academic title): Dr. Szabolcs Pásztor, PhD, associate professor at Ludovika University of Public Service	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 60% - 40% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** Literature review, case study analysis, and interactive classroom discussion	
Form of assessment (exam / practical grade / other): practical grade Additional (specific) methods of knowledge assessment: Creating infographics and data visualizations using Flourish, Inforgram, and Datawrapper.	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): None	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
Since the turn of the millennium, Africa's growing economic role and enormous market potential have attracted increasing attention from scientists, investors and political decision-makers. Many African countries are among the world's fastest-growing economies, attracting investment from multinational companies, sovereign wealth funds, and emerging market partners. The 2020s have added new dimensions to this picture. The COVID-19 pandemic disrupted supply chains, changed labor markets, and strained fiscal balances. Geopolitical tensions, including the war in Ukraine, triggered food and fuel price shocks while reshaping Africa's trade diplomacy. Global trade policy, such as the tariff regime introduced during the Trump administration and the ongoing US-China rivalry, has further affected Africa's access to markets, investment flows and bargaining position. At the same time, climate change, the energy transition, and rapid digitalization are also reshaping the continent's economic priorities. The course aims to provide a comprehensive, fact-based overview of these dynamics.	

Combining relevant theory, economic history, and practical case studies, the course examines both long-term structural trends and the immediate challenges of the 2020s.

Economic history – tracing Africa's economic transformation from the colonial era to independence, through structural adjustment and the growth waves of the early 21st century, highlighting patterns of resilience and structural change.

Political economy and business – examining how global crises, regional integration (AfCFTA), industrial policy, demographic trends, and technological changes are shaping Africa's current and future economic situation.

Upon completion of the course, students will be able to critically assess Africa's growth potential and structural constraints and understand the interactions between global events (wars, trade disputes, climate shocks) and domestic economic policy. In addition, they will be able to assess sector-specific opportunities and risks for doing business in African markets. They will be able to participate in informed debates on Africa's role in a rapidly evolving, multipolar global economy.

2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

- Pásztor, Sz. (2024): Ethiopia: Building a Developmental State or Just Overheating the Economy? In: Kiss, Judit; Tarrósy, István (Szerk.): Selected African Studies in Memory of Zsuzsánna Biedermann. Newcastle upon Tyne, Egyesült Királyság / Anglia: Cambridge Scholars Publishing (2024), ISBN: 978-1-0364-0445-1, 345 p. pp. 73-103., 31 p.

- Onyeiwu, S. (2024): Emerging Issues in Contemporary African Economies: Structure, Policy, and Sustainability. Palgrave Macmillan Cham, ISBN: 978-3-031-74240-8, p. 454.

- Carmody, P. & Murphy, J. (Eds.) (2024): Handbook of African Economic Development. Elgar Handbooks in Development, ISBN: 978-1-80088-579-0, p. 606.

- von Carlowitz, P. & Züfle, S. (2024): Business Success in Africa: Academic and Managerial Insights. Springer Cham, ISBN: 978-3-031-70383-6, p. 361.

2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

- McMillan, M. & Zeufack, A (2023): Labor Productivity Growth and Industrialization in Africa. Policy Research Working Papers World Bank, 10294. http://hdl.handle.net/10986/39411

- Kassa, W. & Owusu, S. (2023): Industrialization in Sub-Saharan Africa: Seizing Opportunities in Global Value Chains. Africa Economics Policy Note, Office of the Chief Economist, Africa Region, March 2023, No. 2 worldbank.org/curated/en/099536403292330454/pdf/IDU0b281c7b4027af04e1f0900809fc00e098c67.pdf

Date: 15 August 2025

Prepared by:

Dr. Szabolcs Pasztor PhD

African peacekeeping and peace support operations
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **African peacekeeping and peace support operations**	Credit value: 6
Course responsible and lecturer (name, academic title): Prod. Dr. János Besenyő	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 100% theory	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** Classroom lectures, case presentations and case studies, participation in project work (article writing).	
Form of assessment (exam / practical grade / other): Additional (specific) methods of knowledge assessment: The student has the opportunity to publish in the English-language, international journal operated by the African Research Institute of the Doctoral School of Security Studies (Journal of Central and Eastern European African Studies/JCEEAS)	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): -	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- To present and explain African conflicts, their characteristics, dynamics, as the root causes of conflicts. - We focus on African peace operations (UN, AU, NATO, EU and other regional organizations), the Christian-Muslim relationship system, migration, the relationship system and cooperation between the countries of the continent and the EU and NATO. - Hungary's participation in African peace operations, its cooperation with African countries.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Evert Kleynhans, Marco Wyss: The Handbook of African Defence and Armed Forces, Oxford University Press, 2025, ISBN: 9780198884750, 896 pages. - János Besenyő, Korotayev Andrey, Issaev Leonid: Terrorism and Political Contention: New Perspectives on North Africa and the Sahel Region, Cham, Switzerland, Springer Nature Switzerland, 2024, ISBN: 9783031534294, 418 pages. - Saleem Ahmad Khan: United Nations Peace Operations in Africa: Civil-Military Coordination and State-Building, New York, Taylor & Francis, 2023, ISBN: 9781000859485, 2014 pages.	

- János Besenyő, Joseph Huddleston, Yahia H. Zoubir: Conflict and Peace in Western Sahara: The Role of the UN's Peacekeeping Mission (MINURSO), Routledge, CRC Press, 2023, ISBN: 9781032257624, 333 pages.
- Jonathan Fisher, Nina Wilén: African Peacekeeping, Cambridge University Press, 2022, ISBN: 9781108499378, 272 pages.
- Besenyő János: Participation of Hungary in African Operations between 1989-2019, Óbudai University Doctoral School on Safety and Security Sciences, Budapest, 2019, ISBN: 9789634491224, 134 pages.

2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

- Besenyő János, Khanyile Moses B., Vogel David: Terrorism and Counter-Terrorism in Modern Sub-Saharan Africa, Cham, Switzerland, Springer Nature Switzerland, 2024, ISBN: 9783031566738, 300 pages.
- Besenyő János: MINURSO United Nations Mission for the Referendum in Western Sahara: Peace Operation Stalled in the Desert, 1991-2021, Warwick, UK, Helion & Company, 2023, ISBN: 9781804514191, 66 pages.
- Bruno Charbonneau, Maxime Ricard: Routledge Handbook of African Peacebuilding, New York, Taylor & Francis, 2022, ISBN: 9780429594618, 308 pages.
- Han Dorussen: Handbook on Peacekeeping and International Relations, Cheltenham,Edward Elgar Publishing, 2022, ISBN: 9781839109935, 408 pages.
- Oliver Furley, Roy May: Peacekeeping in Africa, Routledge, 2021, ISBN: 9781000347548, 338 pages.
- Besenyő János: Darfur Peacekeepers - The African Union peacekeeping mission in darfur (AMIS) from the perspective of a Hungarian military advisor, Paris, France, Éditions L'Harmattan, 2021, ISBN: 9782140190568, 230 pages.

Date: 14.08.2025.

Prepared by:

Prof. Dr. János Besenyő

Application of multibody dynamics in Biomechanics
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Application of multibody dynamics in Biomechanics**	Credit value: 6
Course responsible and lecturer (name, academic title): Dr. habil. Gusztáv Fekete, PhD	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 50% - 50% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** lectures, practical applications (use of MSC.ADAMS and Excel), case presentations and home work.	
Form of assessment (exam / practical grade / other): practical grade Additional (specific) methods of knowledge assessment: -	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): None.	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- Classification of dynamic systems based on constraints (holonomic, non-holonomic). Methods of describing constraint equations. - Two-dimensional, double (compound) pendulum with Newton-Euler equation. Creation of the differential algebraic equation (DAE) of the mechanical system using free-body diagrams. - Potential and virtual velocity fields. Introducing the principle of virtual power. - The Lagrange multiplier. Introduction of Jacobian matrix. - Creation of DAE with passive members (modeling spring and damper). - Standard solution method of DAE systems. - Approximate methods for solving first-order differential equations. Explicit Euler and Center-point approximation. Solving linear and non-linear equations. - Approximate methods for solving second-order differential equations. Introduction of Euler's explicit and implicit solvers. - Solution of non-linear second-order differential equations. Demonstration of Euler-Cromer method for the numerical solution of a DAE. - Description of three-dimensional movements. Description of the finite angular change and angular velocity of rigid bodies by using Euler angles and quaternions. - Multibody dynamics case studies: Gear wear modeling - Multibody dynamics case studies: Modeling wear in prosthetics.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	

Application of multibody dynamics in Biomechanics
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

- Fekete Gusztáv: Bevezetés a többtestdinamikai modellezésbe. Egyetemi jegyzet, Eötvös Loránd Tudományegyetem, 2023. ISBN: 978-615-01-5898-31.
- Jason J. Moord: Learn Multibody dynamics. 2025. Link: https://moorepants.github.io/learn-multibody-dynamics/learnmultibodydynamics.pdf

2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

- H. Vallery, A. L. Schwab: Advanced Dynamics. TU Delft, 2020. ISBN: 978-90-8309-060-3.
- Jielong Wang: Multiscale Multibody Dynamics. Springer, 2023. ISBN: 978-981-19-8443-3

Date: 2025.09.08

Prepared by:

Dr. habil. Gusztáv Fekete

Application of Soft Computing Techniques in Multi-Agent mobile robot Systems (MAS)
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Application of Soft-Computing Techniques in Multi-Agent mobile robot Systems (MAS)**	Credit value: 6
Course responsible and lecturer (name, academic title): István Nagy, PhD	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 70% - 30% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** e.g. case presentations and case study analyses, project work, others... **Basic definitions**, divisions, functions, and methods related to the subject are introduced in the form of a **lecture**. This is followed by an analysis of known methods, followed by the preparation and publication of an article in the last third of the semester.	
Form of assessment (**exam** / practical grade / other): Additional (specific) methods of knowledge assessment: The colloquium is related to the advanced status of the own **article** or **conf. paper**.	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): (typically there are none!)	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- - Review of basic localization, trajectory planning, navigation, and map-making operations of mobile robots. - - Self-organizing capabilities of multi-agent mobile robots. Introduction to agents and their related definitions (autonomy, adaptivity, greedy agent, MÁR systematizations). - - Divisions of mobile robot workspaces and then creation of various graph maps based on these. Introduction to various graph search methods (Dijkstra, A*, A**, Bellman-Ford graph search, Floyd-Warshall graph search, Ant Colony algorithm, Swarm technology, Q-learning and reinforcement (RL) learning. Application of Markov decision-making mechanism to multi-agent environments.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- G. Lozenguez, On the Distributivity of Multi-agent Markov Decision Processes for Mobile Robotics, International Symposium on Swarm Behavior and Bio-Inspired Robotics, Jun 2021, Kyoto, Japan. hal-03545990, - J. Hao, Ho-Fung Leung, Interactions in Multiagent Systems, World Scientific Publishing, 2018.	

Application of Soft Computing Techniques in Multi-Agent mobile robot Systems (MAS)
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

- N. Osman, C. Sierra (Eds), Autonomous Agents and Multiagent Systems, AAMAS2016 Workshop, Revised Selected Papers, Singapore, 2016.
- Johnson, D., Chen, G., and Lu, Y. (2022). Multi-agent reinforcement learning for real-time dynamic production scheduling in a robot assembly cell. IEEE Robot. Autom. Lett. 7, 7684–7691. doi:10.1109/lra.2022.3184795
- Lan, X., Qiao, Y., and Lee, B. (2021). "Towards pick and place multi robot coordination using multi-agent deep reinforcement learning," in 2021 7th International Conference on Automation, Robotics and Applications (ICARA) (IEEE), 85–89.
- J. Liu, J. Wu: Multi-Agent Robotic Systems. CRC Press LLC, Boca Raton, Florida, 2001.

2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

1. Pol, S., Baer, S., Turner, D., Samsonov, V., and Meisen, T. (2021). "Global reward design for cooperative agents to achieve flexible production control under real-time constraints," in Proceedings of the 23rd International Conference on Enterprise Information Systems (ICEIS 2021), Setúbal, Portugal, 515–526.
2. I. Nagy: Genetic Algorithms Applied for Potential Field Building in Multi-Agent Robotic System, Proc. ICCC'03, IEEE International Conf. on Computational Cybernetics, Siófok, Hungary 2003.
3. Nguyen, T. T., Nguyen, N. D., and Nahavandi, S. (2020). Deep reinforcement learning for multiagent systems: A review of challenges, solutions, and applications. IEEE Trans. Cybern. 50, 3826–3839. doi:10.1109/tcyb.2020.2977374
4. I.Nagy: Behaviour Study of a Multi-agent Mobile Robot System During Potential Field Building, Acta Polytechnica Hungarica, Vol. 6, Nr. 4, pp.: 111-136, 2009.

Date:2025. 10. 15.

Prepared by:

István Nagy, PhD

Applied Market Research)
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Applied Market Research**	Credit value: 6
Course responsible and lecturer (name, academic title):Mónika Garai-Fodor Prof. Dr.	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 50% - 50% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** e.g. case presentations and case study analyses, project work, others: case studies and electronic theoretical material, as well as independent project work. Concrete research examples and research reports provide practical guidance for the subject.	
Form of assessment (exam / practical grade / other): practical grade Additional (specific) methods of knowledge assessment: Presentation of the results of independent project work or qualitative research (minimum 10 mini-focus group studies and/or quantitative research involving at least 100 participants) based on the topic of the research presentation, using descriptive and two- or multi-variable analyses.	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): (*typically there are none!*) none	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- The course can help by providing guidance on which methodology and research tools are appropriate and can be used when examining a research question or hypothesis. - The course provides students with a comprehensive overview of the steps involved in the research process, the main primary data collection options, and the methodologically and professionally correct interpretation of the results. - The course introduces the types and tools of qualitative and quantitative surveys. - Students learn the rules for compiling standardized questionnaires, the different types of questions and their corresponding measurement levels, as well as the possibilities, advantages, and disadvantages of their use. - However, in addition to methodologically sound data collection, it is equally important to be able to interpret the data and results correctly. The course also covers the structure of research reports and how research processes build on each other, right up to the rules for presenting research results and practical guidelines. - With this knowledge, students will be able to make informed decisions about the planning and implementation of their own research and learn the rules for correctly interpreting the results.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	

Applied Market Research)
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

- E-learning material related to the subject (Prof. Dr. Mónika Garai-Fodor: Applied Market Research, 2023) - - Mitev Zoltán Ariel, Judit Simon, Tamás Gyulavári, Ágnes Neulinger, Edit Neumann-Bódi, Krisztián Szűcs (2014): Fundamentals of Marketing Research, ISBN: 978 963 05 9528 5 - - Krisztián Szűcs, Erika Lázár, Péter Németh (2023): Marketing Research 4.0. 978 963 454 853 9
2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):
- Naresh Malhotra (2002): Marketing Research, Budapest, KJK, ISBN: 9632246470 - László Sajtos, Ariel Mitev (2007): SPSS Research and Data Analysis Handbook, Alinea Publishing

Date: 10.23.2025.

Prepared by:

Mónika Garai-Fodor Prof. Dr.

Chaos Theory
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Chaos Theory**	Credit value: 6
Course responsible and lecturer (name, academic title): Livia Cvetityanin, Prof.Em.	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": …50…% - …50...% theory – practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** e.g. case presentations and case study analyses, project work, others...	
Form of assessment (exam / practical grade / other): Additional (specific) methods of knowledge assessment:	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): none	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
Objective of the course: To provide students with fundamental knowledge of chaos theory and its applications in nonlinear dynamical systems. **Description of knowledge to be acquired:** Students will acquire - a concise understanding of nonlinear dynamics, - sensitivity to initial conditions, - attractors, - bifurcations, - Lyapunov exponents, and - examples of chaotic behavior in science and engineering.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Robert C. Bishop, An Introduction to Chaotic Dynamics, IOP Publishing, **2022**, **ISBN:** 978-0750364539 - Nonlinear Dynamics - Special Issue: Chaos theory and applications: A retrospective on lessons learned and missed or new opportunities, Editors : Laura Gardini, Celso Grebogi, Stefano Lenci, Vol.102, Issue 2, **2020** (28 articles)	

- Chaos Theory and Applications (in Applied Sciences and Engineering), Vol.5, Issue 2, **2023** (8 articles) ISSN: 2687-4539
2–5 most important <u>recommended</u> readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):
- Adib Mashuri, Nur Hamiza Adenan, Nor Suriya Abd Karim,Tho Siew Wei, Zhaofeng Zeng, Application of Chaos Theory in Different Fields - A Literature Review, Journal of Science and Mathematics Letters, Vol.12, Issue 1, 92-101, **2024** - Feier Su, The Chaos Theory and its Application, Journal of Physics: Conference Series 2012, **2021**, 012118, IOP Publishing, doi:10.1088/1742-6596/2012/1/012118

Date: 31 August 2025

Prepared by:

Livia Cvetityanin

Cyber defense and cybersecurity issues in the 21st century
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Cyber defense and cybersecurity issues in the 21st century**	Credit value: 6
Course responsible and lecturer (name, academic title): Róza Számadó Dr. (PhD)	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 30 % - 70 % theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** - Joint processing of the topic - Case study presentations, processing - Project work: processing of one's own topic, aspects and literature related to the subject, presentation of the task - Other: compilation and presentation of a publication related to the topic of the dissertation, the topic of object	
Form of assessment (exam / practical grade / other): Additional (specific) methods of knowledge assessment: - Evaluation of project work and its presentation - Evaluation of planned publication and its presentation	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): -	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
Aim: To introduce students to the issues of cyber protection, cybersecurity, their place and significance, and development directions. Knowledge material: - Cyberspace in the 21st century - Information security – cybersecurity - Information security – cybersecurity: Security, security science (Security, Critical - infrastructure, Information Security). - Cybersecurity - Conceptual frameworks of cybersecurity, Trends and types of cyber threats. - Cybersecurity issues of central and local government systems - The human side of cybersecurity - The dangers of cyberspace - Implementation of cybersecurity - Cybersecurity in Hungary and the European Union - Regulatory and organizational frameworks - The NIS Directive	

Cyber defense and cybersecurity issues in the 21st century
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

- The GDPR Directive - Domestic and European Union organizations of cybersecurity - Cybersecurity in NATO - International and domestic cybersecurity standards and recommendations - Education, training, research, awareness
2–5 most important <u>required</u> readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):
- Relevant directives and reports of the European Parliament and the Council (EU) - Ádám Farkas • Roland Kelemen • László Vikman (eds.): Cyberspace operations and resilience - Some state and legal issues of cyberspace operations Gondolat Kiadó Budapest, 2024, ISBN 978 963 556 541 2 - ENISA Cybersecurity threat landscape methodology. European Union Agency for Cybersecurity (ENISA), 2025; ISBN 978-92-9204-719-1, DOI 10.2824/1888892
2–5 most important <u>recommended</u> readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):
- Global Cybersecurity Index https://www.itu.int/en/ITU-D/Cybersecurity/Pages/globalcybersecurity-index.aspx - The latest reports and research from professional organizations such as ISACA, Gartner and the Cybersecurity and Infrastructure Security Agency (CISA), with ENISA regularly updating and publishing their reports, research and findings in the field of cybersecurity.

Date:Budapest, 15/09/2025

Prepared by:

Róza Számadó Dr.

Data mining using artificial intelligence
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Data mining using artificial intelligence**	Credit value: 6
Course responsible and lecturer (name, academic title): Dr. habil. Gábor Kiss PhD.	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 50 % - 50% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** During the semester, we perform data mining on various data sets using artificial intelligence. At the end of the semester, students must analyze the data collected during their research in a project. The end-of-semester evaluation is based on the quality of this analysis.	
Form of assessment (exam / practical grade / other): Additional (specific) methods of knowledge assessment:	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): -	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- In doctoral research, it is typically the extraction of knowledge from a large data set that leads to the formulation of the thesis and the methods used to support it. - The use of artificial intelligence in this area also offers new opportunities that should be exploited, thereby increasing the weight of the dissertation work in the field of professional recognition. This is what the subject aims to help in. - The course introduces the principles of Artificial Intelligence, machine learning, neural networks and deep learning. Data collection, data cleansing and data fusion. - We will be introduced to data visualization, classification (nearest neighbor classes, decision trees, Naive Bayes, etc.) Regression analysis, clustering, anomaly detection, time series analysis, dimensionality reduction, supervised and unsupervised learning methods for knowledge extraction.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Di Wu: Data Mining with Python. Theory, Application, and Case Studies, 2024, ISBN 9781032598901. - Vijaya Kumar Suda: Data Labeling in Machine Learning with Python, 2024, ISBN 9781804610541	

Data mining using artificial intelligence
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):
- Sengar D. Modern Data Mining with Python. A risk-managed approach, 2024, ISBN 9789355519146

Date: 02.09.2025.

Prepared by:

Dr. habil. Gábor Kiss

Data security in CRM systems
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Data security in CRM systems**	Credit value: 6
Course responsible and lecturer (name, academic title): Regina Zsuzsánna Reicher, Ph.D.	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": …60…% - …40...% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** e.g. case presentations and case study analyses, project work, others... Review of case studies, familiarization with market software. During the course, students will explore the literature related to their topic.	
Form of assessment (exam / practical grade / other): Additional (specific) methods of knowledge assessment: Oral presentation and preparation of a publishable study closely related to the candidate's topic. Full-length conference presentation in English or Hungarian, or publication in a scientific journal in English or Hungarian.	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): -	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- In this course, PhD students will learn about the methodology that promotes the effective use of a company's business network. - They will learn about the possibilities of applying AI in the field of customer management. - They examine the security risks of AI and data storage and use, as well as the security risks of customer management. - IT security risks are a major focus in this area, as both company and customer data require protection. - They will learn about the security solutions used by companies for customer management and the legal and technological background of secure customer data management. They will learn about the advantages of structured information storage, its daily use, and best practices in customer relations designed to support marketing and proactive sales.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Roy, P., Chandrasekaran, J., Lanus, E., Freeman, L., & Werner, J. (2023). A Survey of Data Security: Practices from Cybersecurity and Challenges of Machine Learning. arXiv (Cornell University). https://doi.org/10.48550/arxiv.2310.04513	

- Huang, Y., Jun, D. L., Lu, B., & Zhou, Y. (2024). Risk analysis in customer relationship management via quantile region convolutional neural Network-Long Short-Term Memory and Cross-Attention mechanism. arXiv (Cornell University). https://doi.org/10.48550/arxiv.2408.12113
- Naim, A., Alqahtani, H., Muniasamy, M. A., Bilfaqih, S. M., Mahveen, R., & Mahjabeen, R. (2023). Applications of information systems and data security in marketing management. In Fraud Prevention, Confidentiality, and Data Security for Modern Businesses (pp. 57-83). IGI Global.
- Nunnagupala, L. S. C., Mallreddy, S. R., & Padamati, J. R. (2022). Achieving PCI Compliance with CRM Systems. Turkish Journal of Computer and Mathematics Education (TURCOMAT)., 13(1), 529–535. https://doi.org/10.61841/turcomat.v13i1.14689

2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

- Boppana, V. R. (2019). Data Privacy and Security in Dynamics CRM Implementations. Educational Research (IJMCER), 1(2), 35-44.
- Hossain, Q., Hossain, A., Nizum, M. Z., & Naser, S. B. (2024). Influence of artificial intelligence on customer relationship management (crm). International Journal of Communication Networks and Information Security, 16(3), 653-663.
- chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://ceur-ws.org/Vol-3925/short06.pdf
- chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.internationaljournalssrg.org/IJCSE/2024/Volume11-Issue9/IJCSE-V11I9P102.pdf?utm_source=chatgpt.com

Date: 15. September 2025

Prepared by:

Regina Zsuzsánna Reicher, PhD.

Database planning and usage
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Database planning and usage**	Credit value: 6
Course responsible and lecturer (name, academic title): KESZTHELYI András László PhD	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject (**underline as appropriate!**)	
Proportion of theoretical and practical content, "Training character": 50% - 50% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes (**underline as appropriate, do not change the number of classes!**) **Methods and (specific) approaches, characteristics used to deliver the course content:** literature review and practical exercises supported by consultations	
Form of assessment (exam / practical grade / other): Additional (specific) methods of knowledge assessment:	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): -	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- To make students know the modern theory and methods of data modelling, their practical application possibilities, in order to be (become) able to manage large amounts of data efficiently in their own research. - Data modelling, general aspects of modelling, levels of database planning, planning methods and tools, SQL.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN): (**should be recent, from the last 3–5 years, can include academic publications**)	
- Ullman – Widom: Database systems, Pearson – Prentice Hall, Upper Saddle River, New Jersey 07458, e.g. https://people.inf.elte.hu/kiss/DB/ullman_the_complete_book.pdf	
2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Halassy Béla dr.: Adatmodellezés, Budapest, 2000. (300 p.) https://mek.oszk.hu/11100/11144/11144.pdf - Kende – Nagy: Oracle példatár, Panem, Budapest, 2005. (740 p.)	

Database planning and usage
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

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Date: 2025-09-15

Prepared by:

KESZTHELYI András László

Environmental Effects of Disasters
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Environmental Effects of Disasters**	Credit value: 6
Course responsible and lecturer (name, academic title): Dr. Elek Barbara Júlia, PhD	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 100 % - 0 % theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes Methods and (specific) approaches, characteristics used to deliver the course content: The transfer of knowledge takes place through lectures and case studies, as well as through the analysis and discussion of case study materials.	
Form of assessment (exam / practical grade / other): exam Additional (specific) methods of knowledge assessment: -	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): -	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- Objectives and scope of environmental impact assessment, including its purpose, national legal frameworks, and the identification of impact factors and processes, with particular attention to transboundary effects. - Principles and methods of environmental risk assessment, including the classification and evaluation of impacts. - Rapid intervention strategies, including approaches for damage mitigation and emergency response	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Suter II, G. W. (2023). *Fundamentals of environmental assessment.* Cambridge: Open Book Publishers. 610 p. ISBN: 978-1-80511-011-9. https://library.oapen.org/handle/20.500.12657/101544 - Intergovernmental Panel on Climate Change. (2022). *Climate change 2022: Impacts, adaptation and vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change.* Cambridge: Cambridge University Press. 3675 p. ISBN: 978-1-00-932584-4. https://doi.org/10.1017/9781009325844	
2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Filho, W. L., Balogun, A.-L., Ayal, D. Y., Bethurem, E. M., & Nagy, G. J. (Eds.). (2021). *The impact of climate change on vulnerable populations.* Cham: Springer.	

532 p. ISBN: 978-3-030-71587-8. https://library.oapen.org/bitstream/id/212cb47a-0a88-4358-bace-236974246c77/external_content.pdf

- Smith, K., Fearnley, C., Dixon, D., Bird, D., & Kelman, I. (2023). *Environmental hazards: Assessing risk and reducing disaster* (7th ed.). London: Routledge. 592 p. ISBN: 978-1-351-26164-7. https://doi.org/10.4324/9781351261647

Date: Budapest, 10 September 2025

Prepared by:

Elek Barbara Júlia

Ergonomic Design of Workplaces
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Ergonomic Design of Workplaces**	Credit value: 6
Course responsible and lecturer (name, academic title): **dr. habil Szabó Gyula**	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / **Optional subject**	
Proportion of theoretical and practical content, "Training character": **50% theory – 50% practice**	
Type of class: lecture / seminar / practice / **consultation** and total number of classes in the given semester: 30 classes Methods and (specific) approaches, characteristics used to deliver the course content: **Interpretation of legislation and standards, case study analysis, risk assessment practice, project work.**	
Form of assessment (exam / **practical grade** / other) Additional (specific) methods of knowledge assessment: **Students are required to carry out an ergonomic analysis of a workplace related to their research area and propose possible improvements.**	
Curricular placement of the course (which semester): Can be taken in semesters **1–4**	
Prerequisites: **none**	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
• The aim of the course is to provide students with the knowledge and skills necessary to apply ergonomic principles in the design of workplaces. • The course introduces the physical, cognitive, and organizational aspects of ergonomics, and the design processes for safe and efficient workplaces. Special attention is given to ergonomic standards (e.g., ISO 26800:2011, ISO 9241 series), risk assessment methods, and the evaluation of workplace interventions. • Students will learn to use both traditional and digital tools for ergonomic analysis, including workplace modeling and task evaluation, and will gain practical experience through project assignments.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
• ISO 26800:2011 Ergonomics – General approach, principles and concepts • ISO 9241 standards (selected parts) – Ergonomic requirements for human-system interaction • International Labour Office, in collaboration with the International Ergonomics Association (2010): Ergonomic Checkpoints: Practical and Easy-to-Implement Solutions for Improving Safety, Health and Working Conditions. 2nd edition. ILO, Geneva • Legal regulations and standards processed during the course	
2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	

- Ricardo, P. Arciniega-Rocha ✉ ; Vanessa, C. Erazo-Chamorro ; Szabó, Gyula: The Prevention of Industrial Manual Tool Accidents Considering Occupational Health and Safety, SAFETY 9 : 3 pp. 2-18. Paper: 51 , 17 p. (2023)
- Ricardo, P. Arciniega-Rocha ; Vanessa, C. Erazo-Chamorro ; Phetsalath, Phimmavong ; Szabo, Gyula, Revolutionizing cleaning: The future of broomstick and dustpan design, Journal of Civil Engineering and Environmental Sciences 9 : 2 pp. 073-078. , 6 p. (2023)

Date: Budapest, 21 August, 2025

Prepared by:

dr. habil Gyula Szabó

"EUFUNCTION": The Focal Points of European Integration
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **"EUFUNCTION": The Focal Points of European Integration**	Credit value: 6
Course responsible and lecturer (name, academic title): Dr. Tibor Babos (Ph.D.), Honorary Professor	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 80% theory – 20% practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** The course is delivered through theoretical lectures, analysis of historical and contemporary case studies, research presentations, and interactive evaluation of European security policy decisions. The methodology aims to develop strategic vision and a deep understanding of complex interrelations within European and transatlantic security.	
Form of assessment (exam / practical grade / other): Additional (specific) methods of knowledge assessment: Students are required to prepare a presentation and a written analytical paper on a selected European security policy issue or capability development process. The highest mark may be awarded for a paper resulting in a related publication.	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): -	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
Europe's current historical era is characterized by the dissolution of the Soviet Union, the Warsaw Pact, and the Council for Mutual Economic Assistance (CMEA), as well as by democratization following German reunification and the concurrent consolidation of dynamic integration and disintegration forces. The course examines both historical and contemporary European integration and disintegration processes, with particular focus on the institutional, political, and security functions of the European Union and NATO. It analyzes the evolution of the European security architecture, the dynamics of EU–transatlantic cooperation, and the strategic implications of supranational and supernational phases of development. The emphasis is placed on integration as a continuous process—on the transformation of the EU–NATO relationship, the emergence of a new European security environment, and the interpretation of the "EU-function" as a key factor of continental stability. Students will gain insight into the functional relationship between the EU and NATO, the interdependence among political, economic, and military dimensions, and the dialectic between integration strategies and the interests of aspirant states.	

The aim of the course is to enable students to form a comprehensive, critical, and strategic understanding of the current state of European unity, cohesion, and integration, as well as its future directions within the global security environment.
2–5 most important <u>required</u> readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):
Babos, T. (2021): The European Security Architecture and Power Projection. Biztonságtudományi Központ Kiadó, Budapest. Kiss, J. L. – Sárvári, G. (2023): European Security in Flux: Strategic Autonomy and Transatlantic Relations. Routledge. Babos, T. (2007): Az európai biztonság öt központi pillére. Zrínyi Kiadó, Budapest. ISBN 978-9633274528. Biscop, S. (2021): European Strategy in the 21st Century: New Future for Old Europe. Routledge. NATO (2023): Strategic Concept – Madrid Summit 2022. NATO Public Diplomacy Division.
2–5 most important <u>recommended</u> readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):
Babos, T. (2020): Military Capability Development in Europe: Between Cooperation and Competition. Nemzet és Biztonság, Budapest. Freedman, L. (2022): Command: The Politics of Military Operations from Korea to Ukraine. Penguin Press. Babos, T. (2011): Globális közös terek a NATO-ban. Nemzet és Biztonság, Budapest. Howorth, J. (2020): Security and Defence Policy in the European Union. Palgrave Macmillan. EEAS (2022): EU Strategic Compass for Security and Defence. European Union External Action Service.

Date: 19 October 2025

Tibor Babos (Ph.D.)

Fire Protection Safety Systems
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Fire Protection Safety Systems**	Credit value: 6
Course responsible and lecturer (name, academic title): Dr. Elek Barbara Júlia, PhD	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 100 % - 0 % theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes Methods and (specific) approaches, characteristics used to deliver the course content: The transfer of knowledge takes place through lectures and case studies, as well as through the analysis and discussion of case study materials.	
Form of assessment (exam / practical grade / other): exam Additional (specific) methods of knowledge assessment: -	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): -	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- The aim of the course is to provide insight into the interrelations of fire protection and its integration with other safety engineering systems. - Protective objectives and fundamental principles of design and operation considered in the planning and operation of buildings, open spaces, and industrial technologies. - Structural requirements of buildings and passive fire protection measures against fire spread. - Design and calculation methods for evacuation. - Heat and smoke extraction systems. - Regulations, procedures, and steps for the design, installation, and operation of built-in fire protection systems	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Buchanan, A., & Östman, B. (Eds.). (2022). *Fire safe use of wood in buildings: Global design guide.* Boca Raton, FL: CRC Press. 444 p. ISBN: 9781003190318. https://doi.org/10.1201/9781003190318 - Athanasopoulou, A., Sciarretta, F., Sousa, M. L., & Dimova, S. (2023). *The status and needs for implementation of Fire Safety Engineering approach in Europe: Support to policies and standards for sustainable construction* (EUR 31383 EN). Luxembourg: Publications Office of the European Union. 134 p. ISBN: 978-92-68-04449-7, JRC131676. https://doi.org/10.2760/031591	

2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

- Helmerking, D. (2020). *Basics fire safety.* Basel: Birkhäuser. 224 p. ISBN: 978-3-0356-1935-5. https://doi.org/10.1515/9783035619362
- Meacham, B. J., & McNamee, M. (Eds.). (2023). *Handbook of fire and the environment: Impacts and mitigation.* Cham: Springer. 451 p. ISBN: 978-3-030-94355-4. https://doi.org/10.1007/978-3-030-94356-1

Date: Budapest, 10 September 2025

Prepared by:

Elek Barbara Júlia

Fuzzy Methods Supporting Decision-Making
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Fuzzy Methods Supporting Decision-Making**	Credit value: 6
Course responsible and lecturer (name, academic title): Pokorádi, László, CSc (technical science)	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 50 % - 50.% theory - practice	
Type of class: lecture / seminar / practice / **consultation** and total number of classes in the given semester: 30 **Methods and (specific) approaches, characteristics used to deliver the course content:** e.g. case presentations and case study analyses, project work, others... case presentations and/or case study analyses	
Form of assessment (exam / practical grade / other): Additional (specific) methods of knowledge assessment: making of a summary study	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): are not	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- basic concepts of risk assessment; - risk assessment using fuzzy numbers; - fuzzy rule-based decision models - Fuzzy Failure Mode and Effects Analysis (FFMEA) - Fuzzy Fault Tree Analysis (FFTA)	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN): (**should be recent, from the last 3–5 years, can include academic publications**)	
- L.A. Zadeh, Fuzzy Sets, INFOR~ATIO~ AND CONTROL 8, 338--353 (1965), DOI: 10.1016/S0019-9958(65)90241-X - Ross, Timothy J., Fuzzy Logic with Engineering Applications, Wiley, 2010 - Jos´e Carlos R. Alcantud, Fuzzy Techniques for Decision Making, MDPI, 2018	
2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Robert Fullér, Fuzzy Reasoning and Fuzzy Optimization, Turku Centre for Computer Science, 1998. ISBN: 952-12-0283-1	

- Harmati, István Á. ; Coroianu, Lucian ; Fullér, Robert, The Median under Orness, FUZZY SETS AND SYSTEMS 481 Paper: 108901 , 16 p. (2024). DOI: 10.1016/j.fss.2024.108901
- Csató, Péter ; Pokorádi, László, Fuzzy Rule-based Comparison of Alternative Jet Fuels, PERIODICA POLYTECHNICA TRANSPORTATION ENGINEERING 53 : 1 pp. 21-30. DOI: 10.3311/PPtr.37138

Date: 15.09.2025.

Prepared by:

Pokorádi, László

International Humanitarian Organizations
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **International Humanitarian Organizations**	Credit value: 6
Course responsible and lecturer (name, academic title): Dr. Sáfár Brigitta PhD	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 50% - 50% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** case presentations and case study analyses	
Form of assessment (exam / practical grade / other): Additional (specific) methods of knowledge assessment: presentation	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): -	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
Course objective: to familiarize students with the standards and guidelines that form the basis for the coordinated and effective operation of international humanitarian aid. Students will learn how humanitarian organizations can contribute to reducing the impact of risk factors, what response systems they operate to help populations affected by disasters and emergencies, and what characteristics make them suitable for this task.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- ICRC (2019) In: Melzer N., Kuster E. International Humanitarian Law. ICRC, Geneva, 2019. ISBN 978-2-940396-75-7 - Sphere Association. The Sphere Handbook: Humanitarian Charter and Minimum Standards in Humanitarian Response, fourth edition, Geneva, Switzerland, 2018. ISBN 978-1-908176-707 PDF	
2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	

- EU Civil Protection and Humanitarian Aid (2023). Sendai Framework for Disaster Risk Reduction. Midterm Review. Luxembourg: Publications Office of the European Union, 2023. ISBN 978-92-68-03989-2
- United Nations Office for Disaster Risk Reduction (2025). Global Assessment Report on Disaster Risk Reduction 2025: Resilience Pays: Financing and Investing for our Future. Geneva. ISBN 9789211576740

Date: 13. September, 2025.

Prepared by:

Dr. Sáfár Brigitta PhD

Long-term corporate success - A secure company
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Long-term corporate success - A secure company**	Credit value: 6
Course responsible and lecturer (name, academic title): Prof. Dr. Takács-György Katalin (In Hungarian: Dr. Takácsné Prof. Dr. György Katalin)	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 30% - …70% theory - practice	
Type of class: lecture / seminar / practice / **consultation** and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** e.g. case presentations and case study analyses, project work, others...	
Form of assessment (exam / **practical grade** / other): Additional (specific) methods of knowledge assessment: Case study on a choosen topic related to the research topic of the Student.	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): -	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	

The aim of the course is to explore business and r9sk in business life from a holistic point of view; relations to their environment along with their internal processes. The general characteristics, such as the work and power structures, business functions of organizations, questions of resource management from wider aspect, value creating processes and financial aspects of investment strategies and general operations are also discussed.

Also important to discuss the specifics and risks of the operation and management of organizations in addition to the general managerial knowledge necessary for the management and management of organizations. They should be able to interpret the role of innovation in value-creating processes in relation to management topics.

The aim is to explore the role of human resources in the safe operation of companies. The questions of the strategic planning of small and medium-sized companies, the application and development of modern methods and procedures related to strategic and change management are of both micro- and macro-economic importance. However, these topics are particularly important at the level of individual economic actors (companies, employees, ...), since long-term corporate success is the key to the security of existence for those affected by the company's operation. By examining the new trends in strategic planning and management – change and innovation management – factors affecting organizational safety in the long term are presented and discussed. The innovation capacity of companies is evaluated along the lines of the expression of Schumpeterian innovation, so in addition to product innovation capacity, the ability to

innovate technologically, organizationally and in the market is examined; the aim is to explore the inhibiting and supporting factors through empirical studies. The research is methodological support for the development of innovation strategies, with particular attention to the sectoral characteristics (services, industrial production, agricultural production). One direction of the research is the investigation of what factors influence the diffusion of innovation in individual sectors. The subject affects several aspects of organizational culture, since one of the elements of success is human resources.
2–5 most important <u>required</u> readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):
- Hisrich, R.D., Peters, M.R. and Shepherd, D.A. (2020) Entrepreneurship. 11th Edition, McGraw Hill, New York. . www.mhhe.com p. 603. - Palalic R., Hisrich R.D., Dana L.P., Ramadani V. (2022): Sustainability of global and international business operations during the adversity and hardship. Heritage and Sustainable Development *Original Research* Vol. 4, No. 1, January 2022, pp.18-26 https://doi.org/10.37868/hsd.v4i1.78 - Business Environment and Organizational Activities Report (Assessment). Exclusively available on IvyPanda®.
2–5 most important <u>recommended</u> readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):
- Lafuente E., Ács Z.J., Sanders, M., Szerb L. (2021): Correction to: The global technology frontier: productivity growth and the relevance of Kirznerian and Schumpeterian entrepreneurship. Small Bus Econ (2020) 55:153–178 https://doi.org/10.1007/s11187-019-00140-1 - Dewhurst J.A. (2014): An Introduction to Business and Business Planning. Free ebook at bookboon.com 1st Edition. p. 123

Date: 25 August, 2025.

Prepared by:

Dr. Takácsné Prof. Dr. György Katalin

Management of information system security
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Management of information system security**	Credit value: 6
Course responsible and lecturer (name, academic title): Dr. Richárd PETŐ	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 100 % - 0 % theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** Lectures and personal consultations, including discussions.	
Form of assessment (exam / practical grade / other): Colloquium, or alternatively, a research paper may replace the colloquium. Additional (specific) methods of knowledge assessment: -	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): None	
Course description:	
- The course introduces effective defense strategies in cyberspace. - It is essential that both users and system operators acquire knowledge about computers, communication devices, and information systems. These are highly complex applications that appear in all areas of life, such as smartphones and tablets, and they carry many risks. This raises the questions: how can we defend against external threats, and what options are available? What hardware devices and software tools can be implemented to protect infrastructure operation, and within it, safeguard our personal data?	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Muha Lajos – Krasznay Csaba: *Management of Electronic Information System Security*. Hungarian-language Educational Material (Book). Published by the National University of Public Service (NKE), Budapest, Hungary, 120 p. 2014; MTMT: 2704831; ISBN: 9786155491658. Full text: https://tudasportal.uni-nke.hu/xmlui/bitstream/handle/20.500.12944/9975/Teljes%20sz%c3%b6veg%21?sequence=2&isAllowed=y - ISO 27001 - COBIT	
2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	

- Act LXXXIV of 2024 on the Resilience of Critical Organizations
- Government Decree 475/2024 (XII. 31.) on the Resilience of Organizations of National Defense and Security Significance
- Act CLXVI of 2012 on the Identification, Designation, and Protection of Critical Systems and Installations

Date: Budapest, 26.08.2025

Prepared by:

Dr. Richárd PETŐ

Mathematical tools of motion analysis in biomechanics
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Mathematical tools of motion analysis in biomechanics**	Credit value: 6

Course responsible and lecturer (name, academic title):
Prof. Dr. István Bíró, full professor, PhD

Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject

Proportion of theoretical and practical content, "Training character":
50 % - 50 % theory - practice

Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes
Methods and (specific) approaches, characteristics used to deliver the course content:

- Overview of the mathematical tools of motion analysis applied in biomechanics, partly in the form of a lecture, partly in the form of an independent analysis.
- Solving a project task related to the student's research topic.
- Analysis of publications with similar content.

Form of assessment (exam / practical grade / other): exam
Additional (specific) methods of knowledge assessment:
The success of the above work is also included in the results of the colloquium.

Curricular placement of the course (which semester): Can be taken in semesters 1–4

Prerequisites (if any): (*typically there are none!*) none

Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired

Aim of the course:
The aim of the course is the deeper understanding of the biomechanics of human motion in sports and rehabilitation. During the investigation of different human motion, processing of a large number of kinematical data is necessary. Different type of motion capture systems, equipments and methods such as optical, electromagnetic and image-based techniques can be applied. For deeper investigation, the processing of measured data is necessary to calculate various special kinematic and kinetic parameters. In these cases the application of special mathematical tools are indispensable.

Course description:
Review and analytical evaluation of different mathematical tools can be applied motion analysis. The 2nd part of the content of the course is the application of some reviewed and evaluated mathematical tools in own research topic.

2–5 most important <u>required</u> readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):
Iwan W. Griffiths: Principles of biomechanics & motion analysis. Lippincott Williams & Wilkins, 2006, ISBN 0-7817-5231-0, 2006 Jaehwang Seol, Kicheol Yoon and Kwang Gi Kim: Mathematical Analysis and Motion Capture System Utilization. Method for Standardization Evaluation of Tracking Objectivity of 6-DOF Arm Structure for Rehabilitation Training Exercise Therapy Robot, Diagnostics, 2022, 12, 3179. https://doi.org/ 10.3390/ diagnostics12123179
2–5 most important <u>recommended</u> readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):
Duane Knudson: Fundamentals of Biomechanics, 2nd Edition, Springer, 2007, ISBN 978-0-387-49311-4 Vladimir M. Zatsiorsky: Kinetics of Human Motion, ISBN: 9780736037785, 2002 Bíró István, Fekete Gusztáv: Approximate Method for Determining the Axis of Finite Rotation of Human Knee Joint, ACTA POLYTECHNICA HUNGARICA 11:(9) pp. 61-74. (2014) G Fekete, B M Csizmadia, M A Wahab, P Baets, L Vanegas-Useche, I Biro: Patellofemoral Model of the Knee Joint Under Nonstandard Squatting, DYNA-COLOMBIA 81:(183) pp. 60-67. (2014) István Bíró, Béla M. Csizmadia, Gábor Katona: Sensitivity investigation of three-cylinder model of human knee joint, BIOMECHANICA HUNGARICA 3:(1) pp. 33-42. (2010)

Date: 11/09/2025

Prepared by:

Prof. Dr. István Bíró

Measurement of Non-Electrical Quantities
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Measurement of Non-Electrical Quantities**	Credit value: 6
Course responsible and lecturer (name, academic title): Prof. Dr. József Sárosi full professor	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 50% - 50% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** Case presentations and case study analyses, project work, taking measurements.	
Form of assessment (exam / practical grade / other): assignment, case study presentation. Additional (specific) methods of knowledge assessment: -	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): -	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- Most quantities to be measured are non-electrical such as temperature, pressure, displacement, humidity, fluid flow, etc., but these quantities cannot be measured directly. Hence such quantities are required to be sensed and changed into some other form of quantities. Therefore, for measurement of non-electrical quantities these are to be converted into electrical quantities. During the course the principles and practice of electrical instruments for the measurement of non-electrical quantities are presented and investigated. - Introduction to measurement. Instrument types and performance characteristics. Errors during the measurement process. Bridge circuits. Measurement sensors and instruments. Study of the measurement of different non-electrical quantities through electrical methods.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Ekbert Hering - Gert Schönfelder: Sensors in Science and Technology, Springer, 2022, 835 p., ISBN 978-3-658-34920-2 - S. P. Venkateshan: Mechanical Measurements, Springer, 2022, 570p. ISBN 978-3-030-73619-4	
2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	

- Alexander W. Koch: Measurement and Sensor Systems, Springer, 2023, 253 p., ISBN 978-3-031-15869-8
- Dan Mihai Ştefănescu: Handbook of Force Transducers, Springer, 2020, 257 p., ISBN 978-3-030-35321-6

Date: 13/09/2025

Prepared by:

Prof. Dr. József Sárosi

Modelling of Technical Systems
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Modelling of Technical Systems**	Credit value: 6
Course responsible and lecturer (name, academic title): Pokorádi, László, CSc (technical science)	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 50 % - 50.% theory - practice	
Type of class: lecture / seminar / practice / **consultation** and total number of classes in the given semester: 30 **Methods and (specific) approaches, characteristics used to deliver the course content:** e.g. case presentations and case study analyses, project work, others... case presentations and/or case study analyses	
Form of assessment (exam / practical grade / other): Additional (specific) methods of knowledge assessment: making of a summary study	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): are not	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- .classification of mathematical models; - modeling methods; - dimensional analysis; - single- and multi-parameter sensitivity analysis; - correlation-family analysis; - state estimation methods.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN): (**should be recent, from the last 3–5 years, can include academic publications**)	
- System Book, http://sysbook.sztaki.hu/; - Pokorádi, László, Szabolcsi, Róbert, Mathematical Models Applied to Investigate Aircraft Systems, nomográfia, Monographical Booklets in Applied and Computer Mathematics, MB-12, PAMM, Műegyetemi Kiadó, Budapest, 1999., pp. 146. ISBN: 9634206514 - Heinz, "Mathematical Modeling" Springer Heidelberg Dordrecht London New York, 2011. ISBN: 978-3-642-44388-6	

2–5 most important <u>recommended</u> readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN): (**should be recent, from the last 3–5 years, can include academic publications**)
- Dagpunar, J. S. (2007), Simulation and Monte Carlo, John Wiley & Sons Inc. ISBN: 978-0-470-85494-5 - NASA Systems Engineering Handbook, https://www.nasa.gov/wp-content/uploads/2018/09/nasa_systems_engineering_handbook_0.pdf

Date: 15.09.2025.

Prepared by:

Pokorádi, László, CSc

Modern statistical methods in Research
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Modern statistical methods in Research**	Credit value: 6
Course responsible and lecturer (name, academic title): Prof. Dr. Andrea Tick	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 40% -60% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** e.g. case presentations and case study analyses, project work, others... Lectures: partly e-learning, partly face-to-face lectures Practical work: case studies and case study analysis, practical examples using software, software analysis of unknown data sets, software analysis of own research data	
Form of assessment (exam / practical grade / other): exam Additional (specific) methods of knowledge assessment: written assignments, one publication	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): -	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
Within the framework of the subject, students receive an overview of the scientifically sound research process, the development of the research plan, the individual research methods and the possibilities of data collection and validation. The aim of the subject is also to present the repository of statistical methods and the procedures that can be applied in research. A great emphasis is placed on meeting the expectations of scientific research in every step of the whole research process, from data collection through model design and building to the evaluation of the results. Research planning. Primary research methods (experiment, questionnaire survey, focus group research). Secondary research methods. Development of the principles of data collection, examination of data sources (measurement methods and data types, definition of variables), review of sampling procedures, development of rules, procedures (sample size). Settlement of the legal background for data collection (GDPR). Data validation. Types and forms of analysis, methods used for analysis, test methods offered by statistics, application of modern statistical analysis software, univariate, crosstab, ANOVA, factor analysis. Methods and possibilities of correlation and regression calculation, discriminant analysis and logistic regression. Use of computer software specialized in quantitative data analysis, effective application of Power BI, SAS and SPSS in the analysis and evaluation process, the potential so AI for statistical analysis. Examples, case studies.	

2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN) (seminal work is listed as well):

- Mohr, Donna L., William J. Wilson, and Rudolf J. Freund. Statistical Methods. Elsevier, 2021, p.784, ISBN 978-0-12-823043-5
- Fein, Erich, John Gilmour, Tanya Machin, and Liam Hendry. Statistics for Research Students: An Open Access Resource with Self-Tests and Illustrative Examples. University of Southern Queensland, 2022. p.109, https://doi.org/10.26192/q7985, ISBN 9780645326109, https://usq.pressbooks.pub/statisticsforresearchstudents/
- Çetinkaya-Rundel, Mine, and Johanna Hardin. Introduction to Modern Statistics (2e). OpenIntro, 2024. p. 510, https://openintro-ims.netlify.app/, ISBN 978-1-943450-27-5
- Field, Andy. Discovering Statistics Using IBM SPSS Statistics. 6th edition. Sage, Los Angeles London New Delhi Singapore Washington DC Melbourne, 2024, p.1110, ISBN: 9781529630008
- Bramer, Max. Principles of Data Mining. Undergraduate Topics in Computer Science. Springer London, 2020. P. 571, ISBN 978-1-4471-7492-9 978-1-4471-7493-6, https://doi.org/10.1007/978-1-4471-7493-6

2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN): (**seminal literature is listed**)

- Szűcs, Kata Rebeka, Andrea Tick, and Regina Zsuzsanna Reicher. “Applying Attitude Theory to Determine User Security Approaches.” Serbian Journal of Management 19, no. 1 (2024): 133–48. https://doi.org/10.5937/sjm19-45280.
- Tick, Andrea. “Evaluation of Industry 4.0 Familiarity at SMEs in Central-Eastern Europe Using Machine Learning Algorithms.” 2023 IEEE 17th International Symposium on Applied Computational Intelligence and Informatics (SACI), IEEE, May 23, 2023, 000643–48. https://doi.org/10.1109/SACI58269.2023.10158645.
- Tick, Andrea. “Industry 4.0 Narratives through the Eyes of SMEs in V4 Countries, Serbia and Bulgaria.” Acta Polytechnica Hungarica 20, no. 2 (2023): 83–104. https://doi.org/10.12700/APH.20.2.2023.2.5.
- Parr-Rud, Olivia. Business Analytics Using SAS Enterprise Guide and SAS Enterprise Miner: A Beginner’s Guide. SAS Institute Inc, 2014. p.168, ISBN 978-1-62959-327-2
- Cody, Ronald P. Biostatistics by Example Using SAS Studio. 1st ed. SAS Institute, Cary, NC, 2016, p.262, ISBN 978-1-62960-493-0
- Ott, Lyman, and Michael Longnecker. An Introduction to Statistical Methods & Data Analysis. Seventh edition. Cengage, 2020, p.1174, ISBN 978-0-357-67062-0

Date: 10 September 2025

Prepared by: PROF. DR. ANDREA TICK

Operational security aspects of human contact networks
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Operational security aspects of human contact networks**	Credit value: 6
Course responsible and lecturer (name, academic title): Dr. Szilágyi Győző Attila (Ph.D.)	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 30% - 70% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** - processing relevant network science literature, - learning and analyzing real organizational case studies, - learning about quantitative methods of network science and mastering their practical application, - conducting specific research on the topic.	
Form of assessment (exam / practical grade / other): oral exam Additional (specific) methods of knowledge assessment: The exam can be replaced by a scientific publication on the topic.	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): none	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
The course examines the human factor of the operational security of organizations from a network science perspective. The overall goal of the course is for students to learn about the various human relationship networks of organizations, the properties of these networks, and the resulting operational security implications. The specific goal of the course is for students to: - master the basics of network science, - learn about the complex human relationship network of organizations, - be able to identify the individual network layers of the complex organizational network and their network properties, - be able to identify and manage the resulting operational security implications, - be able to perform quantitative analyses on human relationship networks.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	

- Barabási, A-L., (2022): Behálózva, Open Books, Budapest, ISBN: 978-963-572-595-3
- Barabási, A-L., (2024): A hálózatok tudománya, Open Books, Budapest, ISBN: 978-963-572-024-8
- Scott, J.; (2022): Social Network Analysis. 5. ed., Sage, ISBN: 9781526460724

2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

- Schweitzer, F. et al. (2022): Modeling social resilience: Questions, answers, open problems, Advances in Complex Systems, vol. 25, No. 8. pp.1-54..
- Finn, K.R., Silk, D., Porter, S.C., Croft, D.M., Farine. D.S. (2021): Multilayer network analyses as a toolkit for measuring social structure. Philosophical Transactions of the Royal Society B: Biological Sciences, 376(1839), Current Zoology, Vol. 67, No, 1, pp. 81-99. DOI: 10.1093/cz/zoaa079
- Sargent, T.J., Stachurski, J., (2024): Economic Networks, Theory and Computation, Cambridge University Press, DOI: 10.1017/9781009456340, ISBN 978-1-009-45635-7

Date: 2025. 09. 10.

Prepared by:

Győző Attila Szilágyi Ph.D.

Optimization methods
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Optimization methods**	Credit value: 6
Course responsible and lecturer (name, academic title): **Dr. habil László Hanka PhD**	
Course classification: **Optional subject**	
Proportion of theoretical and practical content, "Training character": 50 % - 50% theory - practice	
Type of class: lecture / **seminar** / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** - project work - processing data - application of Excel for data processing - application of Matlab for calculations - presenting running codes - creating Simulink simulation - case study analyses,	
Form of assessment (exam / practical grade / other): exam Additional (specific) methods of knowledge assessment: Presenting mathematcal models, using Excel, Matlab codes, Simulink simulation	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): no	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired - mathematical concept of risk, assessing risk using mathematical methods - learning tools of probability theory and mathematical statistics for assessing the risk - one- and multidimensional distributions, Bayesian probablity, prior and posterior distributions - tools of mathematical statistics, estimation theory, confidence intarvals, hypothesis testing, goodness of fit tests, etc.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN): - Fletcher: Practical methods for optimization. John Wiley and Sons. 2008. ISBN: 978-0-471-91547-8	

- Luenberger: Linear and Nonlinear Programming. Springer. 2008. ISBN: 978-0-387-74502-2 - Rao: Engineering Optimization Theory and Practice. John Wiley and Sons. 2009. ISBN: 978-0-470-18352-6
2–5 most important <u>recommended</u> readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):
- Bierlaire: Optimization: Principles and Algorithms. EPFL Press. 2018. ISBN 978-2-88915-279-7 - Haupt: Practical genetic Algorithms: John Wiley and Sons. 2008. ISBN 0-471-45565-2

Date: 01.09.2025.

Prepared by:

Dr. habil László Hanka

Overview and analysis of the history and events of security technology
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Overview and analysis of the history and events of security technology**	Credit value: 6
Course responsible and lecturer (name, academic title): Endre Szűcs PhDD	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 100% - ……% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** Presentation and discussion of topics. The topics are available on Moodle, which students can access before the class.	
Form of assessment (exam / practical grade / other): Article writing. Additional (specific) methods of knowledge assessment: Checking the content and format of an article.	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): (*typically there are none!*)	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
The aim of the course. To familiarize students with the history of safety engineering by period. To provide an overview of the materials and tools that influence safety engineering and their main characteristics. To explore the development of the fields of safety engineering and their mutual influence. Course content and description: To examine security technology throughout historical periods and identify the connections between them. To review the development of these connections and explore the role of individual tools that contributed to achieving a higher level of security. Analyze the impact of technical standards on security technology tools throughout history. Review the social conditions of each era with the aim of determining the level of security, taking into account the needs and possibilities of the "customer."	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- E Szűcs: Military and Technical History: From Prehistory to the Late Middle Ages. Budapest, Óbuda University (2014), 177 p.	

Overview and analysis of the history and events of security technology
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

- L. Berek, T. Berek, L. Berek: PERSONAL AND PROPERTY SECURITY. Budapest: ÓE-BGK 3071, 2016. 978-615-5460-94-4
2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):
- - J Burke: Connections. Alexandra Publishing House, Pécs, 2006. ISBN 963 368 612 1 - - F R Paturi (ed.): Chronicle of Technology. Officina Nova, Budapest, 1997. ISBN 963 7836 44 6 - - E Szűcs: The security technology tools of "primitive man," HADMÉRNÖK 11: (4) pp. 216-221. 2016. - - T Turós; E Szűcs. The relationship between the development of soccer and match security from its beginnings to the end of the 1980s. BELÜGYI SZEMLE / ACADEMIC JOURNAL OF INTERNAL AFFAIRS: THE PROFESSIONAL SCIENTIFIC JOURNAL OF THE MINISTRY OF THE INTERIOR (2010-) 71: 12 pp. 2145-2161. 17 p. (2023). - - E Szűcs; L Záhonyi. A historical examination of the development of information security – Milestones, events and responses. SECURITY SCIENCE REVIEW 3: 3 pp. 81-91., 11 p. (2021).

Date: 02.09.2025.

Prepared by:

Endre Szűcs PhD

Personal and property protection
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Personal and property protection**	Credit value: 6
Course responsible and lecturer (name, academic title): Dr. Tamás BEREK (PhD)	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 60% - 40.% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** e.g. case presentations and case study analyses, project work, others... Lecture using the frontal method, seminar discussing pre-assigned questions with my supervisor.	
Form of assessment (exam / practical grade / other): exam grade Additional (specific) methods of knowledge assessment: The evaluation consists of two parts: firstly, the discussion of the given questions in the seminar, and secondly, the evaluation of a scientific article or conference presentation prepared for the subject.	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): (*typically there are none!*) -	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
• The concept of security, the main areas of personal and property protection, their specificities. • Personal protection. • The main areas of property protection. • Interpretation of guarding and protection, its complexity. • Mechanical protection, applied electronic signaling systems, the place and role of manpower in complex guarding and protection.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Dr. Berek Lajos: Biztonságtechnika, NKE, Budapest, 2014. http://vtki.uninke.hu/uploads/media_items/biztonsagtechnika.original.pdf - Dr. Berek Lajos, Dr. Berek Tamás, Berek László: Személy- és vagyonbiztonság, Óbudai Egyetem, Budapest, 2016. ISBN 978-615-5460-94-4	
2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	

- Tóth Attila-Tóth Levente: Biztonságtechnika, NKE, Budapest, 2014. ISBN 978-615-5305-56-6
- Christián L,-Major L,- Szabó Cs [szerk.]: Biztonsági vezetői kézikönyv, Ludovika Egyetemi Kiadó, Budapest, 2020. ISBN 978-963-5310-70-8.
- Horváth T. : Mechanikai védelem, mint késleltetés a fizikai védelemben, NKE Budapest, 2021 In. Hadmérnök p 23–32. ISSN 1788-1919 (online) https://doi.org/10.32567/hm.2021.1.2
- Szabó Lajos: Az objektumok biztonsága és az objektumvédelem speciális területe a megelőző védelem, PhD értekezés, ÓE BDI 2021. https://oda.uni-obuda.hu/bitstream/handle/20.500.14044/10329/Szabo_Lajos_ertekezes.pdf?sequence=1&isAllowed=y

Date: 12. september 2025

Prepared by:

Dr. Berek Tamás

Possibilities of operating security systems
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Possibilities of operating security systems**	Credit value: 6
Course responsible and lecturer (name, academic title): Dr. Richárd PETŐ	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 100 % - 0 % theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** - Discussion of monitoring and security systems of existing or under-construction facilities, depending on function - Review of practical solutions	
Form of assessment (exam / practical grade / other): colloquium Additional (specific) methods of knowledge assessment: Colloquium, or alternatively, a research paper may replace the colloquium.	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): None	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- It is essential to understand operational options that enable cost-effective, well-designed solutions. The following perspectives are analyzed: ▪ Examination of physical/virtual server and storage environments ▪ Active Directory / LDAP ▪ Operating system level analysis (Windows / Linux) ▪ Establishment of monitoring systems ▪ Implementation of Help Desk / Service Desk incident reporting systems	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- COBIT - ISO 45000 - ISO 27001	
2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	

- *Sustainable and Safe Cities Through Computer Applications*; Interdisciplinary Description of Complex Systems 23:3, pp. 207–216 (2025); https://hrcak.srce.hr/332928
- Péter Hunorfi, Tibor Farkas: *Cybersecurity of Operational Technology in Critical Infrastructures*; Belügyi Szemle, Vol. 73, Special Issue 1 (2025), published 2025-06-27
- Hunorfi, P. (2024). *The Theory and Practical Application of the ISO/IEC 27001 Standard in Light of Cybersecurity Reports of OT/ICS Systems*. Scientia et Securitas, 5(3), 323–332. https://doi.org/10.1556/112.2024.00228

Date: Budapest, 26.08.2025

Prepared by:

Dr. Richárd PETŐ

Possibilities of using artificial intelligence in security systems
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Possibilities of using artificial intelligence in security systems**	Credit value: 6
Course responsible and lecturer (name, academic title): Dr. habil. Kollár Csaba PhD.	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 25% - 75% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** 1. getting to know the theoretical professional-scientific framework of the topic (directed literature review) 2. research on the topic using qualitative and/or quantitative methods (e.g.: online, large-scale questionnaire, expert interviews) 3. getting to know the topic in practice (e.g. processing case studies, benchmarking method)	
Form of assessment (exam / practical grade / other): Additional (specific) methods of knowledge assessment: A personalized written assignment (preparation of a scientific-professional study), which focuses on the topic of the doctoral student and the topic of the subject.	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): no prerequisites for pre-studies	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- To learn about the developments and trends of artificial intelligence in security technology, with current and near future applications. - Overview of related technologies and synergies such as big data analytics, IoT/IIoT, sensor networks, AR/VR/XR, cloud computing, robots and drones. - Understanding the operation and application areas of AI-based security technology solutions, such as facial recognition, shape and motion recognition, text recognition, fraud detection, predictive models. - To examine the impact of artificial intelligence on the human resources strategy and operation of security technology companies. - Exploring the information security and data protection challenges of security systems supporting AI, assessing risks. - Preparation of scientific and professional publications to summarize and present the acquired knowledge.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	

- Kollár, Csaba: A mesterséges intelligencia megjelenése a biztonságtudományban. In: Tibor, János Karlovitz (szerk.) What will our Future be Like? : 2 essays in German, 7 in English, 30 in Hungarian language (Német, angol és magyar nyelvű esszék). Grosspetersdorf, Ausztria : Sozial und Wirtschafts Forschungsgruppe (2023) 448 p. pp. 242-256. , 15 p.
- Kollár, Csaba: A magyarországi magánbiztonsági szektor válasza a mesterséges intelligencia kihívásaira, avagy: Biztonság és technika a mesterséges intelligencia korában. In: Kiss, Gábor (szerk.) 30TH ANNIVERSARY CONFERENCE OF THE SAFETY AND SECURITY ENGINEERING EDUCATION : A BIZTONSÁGTECHNIKAI MÉRNÖK KÉPZÉS 30 ÉVI JUBILEUMI KONFERENCIÁJA. Budapest, Magyarország : Óbudai Egyetem (2023) 127 p. pp. 35-56. , 22 p.

2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

- Careglio, D. ; Bahón, C. Angulo ; Moreira, A.I. Alves ; Jakobi, A. ; Dimova, R. ; Dovramadjiev, T. ; Ejubovic, A. ; Sukhovii, E. ; Kollar, C. ; Szabo, G.: LIFE IN THE AI ERA First result of the Erasmus+ HEDY project. In: Järvinen, Hannu-Matti; Silvestre, Santiago; Llorens, Ariadna; Nagy, Balàzs (szerk.) SEFI 2022 50th Annual Conference of The European Society for Engineering Education Proceedings: Towards a new future in engineering education, new scenarios that European alliances of tech universities open up. Barcelona, Spanyolország : Universitat Politécnica de Catalunya (2022) pp. 1031-1040. , 10 p.
- Kollár, Csaba: A mesterséges intelligencia városi és társadalmi léptéke. Kolozsvár, Románia : Koinónia Kiadó (2022) , 220 p. ISBN: 9789731652603
- Csaba, Kollár ; Barna, Nagy: A mesterséges intelligencia felhasználási lehetőségei az objektumfelismerésben (első rész) BIZTONSÁGTUDOMÁNYI SZEMLE 3 : 1 pp. 123-140. , 18 p. (2021)
- Csaba, Kollár ; Barna, Nagy: A mesterséges intelligencia felhasználási lehetőségei az objektumfelismerésben (második rész) BIZTONSÁGTUDOMÁNYI SZEMLE 3 : 2 pp. 115-129. , 15 p. (2021)

Date: August 14, 2025

Prepared by:

Dr. Dr. habil. Kollár Csaba PhD.

Practical Biometrics
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Practical Biometrics**	Credit value: 6
Course responsible and lecturer (name, academic title): Dr. Őszi Arnold	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 50 % - 50 % theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** Lectures, consultations, case presentations, and case study analyses.	
Form of assessment (exam / practical grade / other): exam grade Additional (specific) methods of knowledge assessment: Individual student work	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): none	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- Students will gain knowledge of the characteristics and main types of biometric devices, as well as their applicability in real-world scenarios: why and to what extent different biometric devices deviate from their specifications, and for which tasks they can be optimally used. - Through laboratory sessions and practical applications, students will acquire knowledge and hands-on experience with fingerprint, hand geometry, facial recognition, iris, palm vein, finger vein, and complex identification systems.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Almuwayziri, S.; Al-Nafjan, A.; Aljumah, H.; Aldayel, M. Deep Learning-Based Fingerprint–Vein Biometric Fusion: A Systematic Review with Empirical Evaluation. Appl. Sci. 2025, 15, 8502. https://doi.org/10.3390/app15158502 - Shadman, R.; Hou, D.; Hussain, F.; Murshed, M.G.S. Explainable Face Recognition via Improved Localization. Electronics 2025, 14, 2745. https://doi.org/10.3390/electronics14142745 - Kang, G.; Park, J.; Kim, Y.-G. Continuous Behavioral Biometric Authentication for Secure Metaverse Workspaces in Digital Environments. Systems 2025, 13, 588. https://doi.org/10.3390/systems13070588 - Meng, H.; Zhang, L.; Yang, F.; Hai, L.; Wei, Y.; Zhu, L.; Zhang, J. Livestock Biometrics Identification Using Computer Vision Approaches: A Review. Agriculture 2025, 15, 102. https://doi.org/10.3390/agriculture15010102 - EL Fadel, N. Facial Recognition Algorithms: A Systematic Literature Review. J. Imaging 2025, 11, 58. https://doi.org/10.3390/jimaging11020058	

Practical Biometrics
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):
- Al-Nafjan, A.; Alahaideb, L.; Aldayel, M.; Aljumah, H. EEG-Based Authentication Across Various Event-Related Potentials (ERPs). Sensors 2025, 25, 4962. https://doi.org/10.3390/s25164962 - Zhang, Z.; Liu, P.; Su, C.; Tong, S. A High-Speed Finger Vein Recognition Network with Multi-Scale Convolutional Attention. Appl. Sci. 2025, 15, 2698. https://doi.org/10.3390/app15052698 - Harezlak, K.; Pluciennik, E. Towards Improved Eye Movement Biometrics: Investigating New Features with Neural Networks. Sensors 2025, 25, 4304. https://doi.org/10.3390/s25144304

Date: 2025.08.15.

Prepared by:

Dr. Őszi Arnold

Problems of safe scaling of adaptive and robust control of nonlinear dynamic systems
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Problems of safe scaling of adaptive and robust control of nonlinear dynamic systems**	Credit value: 6
Course responsible and lecturer (name, academic title): Prof. József Tar DSc	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 50% - 50% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** What methods, (specific) ways and characteristics are used to transfer the given knowledge: overview of the model structure of robots as dynamic systems with a theoretical foundation; the method of incorporating the proposed special adaptive control into the available dynamic model; formulation and convergence of kinematic expectations; the possibility and modes of convergence of the adaptive method; issues of parameter estimation and the significance of the estimation; with laboratory exercises: sequential Julia language-based basic programs for different kinematic requirements in the case of a special dynamic model; presentation of a model library for different dynamic models; the student creatively reworks the chosen kinematic basic program for the case of another dynamic model.	
Form of assessment (exam / practical grade / other): Additional (specific) methods of knowledge assessment: In addition to the classic colloquium, the operation of the methods in question can be discussed through the parameter settings of the developed program.	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): ----	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- Understanding the structure and uses of dynamic (typically robotic) models in dynamic control. - Understanding the important differences between adaptive controls based on the Lyapunov function and the Banach theorem. - Learning to simulate the control of dynamic systems through simple sequential codes. - nvestigating the impact of complex effects of control parameters and approximate dynamic models using simulation.	

Problems of safe scaling of adaptive and robust control of nonlinear dynamic systems
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

- B. Armstrong, O. Khatib and J. Burdick. The Explicit Dynamic Model and Internal Parameters of the PUMA 560 Arm. Proc. IEEE Conf. On Robotics and Automation 1986, 1986, pp. 510-518, doi = 10.1109/ROBOT.1986.1087644, url = https://resolver.caltech.edu/CaltechAUTHORS:20190612-075818151

- P.I. Corke and B. Armstrong-Helouvry. Proceedings of the 1994 IEEE International Conference on Robotics and Automation. "A search for consensus among model parameters reported for the PUMA 560 robot, 1994, vol. 2, pp. 1608-1613, doi = 10.1109/ROBOT.1994.351360

- J.K. Tar, J.F. Bitó, L. Nádai and J.A. Tenreiro Machado. Robust Fixed Point Transformations in Adaptive Control Using Local Basin of Attraction. Acta Polytechnica Hungarica}, 2009, vol. 6, no. 1, pp. 21-37

- B. Csanádi,P. Galambos, J.K. Tar, Gy. Györök, and A. Serester. 2018 IEEE International Conference on Systems, Man, and Cybernetics (SMC). "A Novel, Abstract Rotation-Based Fixed Point Transformation in Adaptive Control}", 2018, pp. 2577-2582, doi = 10.1109/SMC.2018.00441

- A. Atinga and J.K. Tar. Tackling Modeling and Kinematic Inconsistencies by Fixed Point Iteration-Based Adaptive Control, Machines, vol. 11, no. 6, article number 585, 2023, url = https://www.mdpi.com/2075-1702/11/6/585, ISSN: 2075-1702, doi = 10.3390/machines11060585

2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

- A.M. Lyapunov. Stability of Motion. Academic Press, New-York and London, 1966.

- S. Banach. Sur les opérations dans les ensembles abstraits et leur application aux équations intégrales (About the Operations in the Abstract Sets and Their Application to Integral Equations), Fund. Math., 1922, vol. 3, pp. 133-181, url = http://eudml.org/doc/213289

- J.J.E. Slotine and W. Li. Applied Nonlinear Control, isbn=9780130400499, lccn=90033365, Prentice-Hall International Editions, url=https://books.google.hu/books?id=HddxQgAACAAJ, 1991, Prentice-Hall

- A. Awudu, K. Kósi and J.K. Tar. Novel Metric to Quantify the Consequences of Modeling Imprecisions in Adaptive Dynamic Control (Accepted for publication), Acta Polytechnica Hungarica, 2025

- A. Atinga, K. Kósi and J.K. Tar. Multivariable Steffensen's Accelerator in Adaptive Sliding Mode Control, Acta Polytecnica Hungarica, vol. 21, no. 10. pp. 413-438, doi = 10.12700/APH.21.10.2024.10.26

Date: Budapest, 17 August 2025

Prepared by:

Prof. Dr. József K. Tar

Programming in MATLAB
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Programming in MATLAB**.	Credit value: 6.
Course responsible and lecturer (name, academic title): Prof. Dr. Róbert Szabolcsi, DSc.	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 10% - 90% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes. **Methods and (specific) approaches, characteristics used to deliver the course content:** the course starts with short introduction to MATLAB basic programming. Students brings their own scientific problems into the course to solve them using MATLAB.	
Form of assessment (exam / practical grade / other): 'Exam'. Additional (specific) methods of knowledge assessment: at the end of the course students deliver report to the lecturer in the form of a scientific essay to be evaluated. MATLAB scripts written by the students shall be evaluated and results gained shall be validated.	
Curricular placement of the course (which semester): Can be taken in semesters 1–4.	
Prerequisites (if any): —	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- MATLAB basics. - MATLAB toolboxes. - Solution of mathematical problems using MATLAB. - Use of Control System Toolbox - Use of Robust Control Toolbox - Use of MPC toolbox. Outlook for Simulink and its toolboxes.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- R. Szabolcsi: Conceptual and Preliminary Computer-Aided Design and Analysis of the Small UAVs Applied for Governmental Purposes, ISBN 9786150230498, 254p, Budapest, 2025. - MATLAB 2025b, User's Guide, The MathWorks Ltd., 2025. - R. K. Yedavalli: Flight Dynamics and Control of Aero and Space Vehicles. John Wiley & Sons, Ltd., ISBN: 978-1-118-93445-6, 2020.	
2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	

- Jameel Al-Kamil Safa; Szabolcsi Róbert: Optimizing path planning in mobile robot systems using motion capture technology. Results in Engineering, (2590-1230 2590-1230): Vol 22 Paper 102043. 9 p., 2024.
- Al-Kamil Safa Jameel; Szabolcsi Róbert: Enhancing Mobile Robot Navigation: Optimization of Trajectories through Machine Learning Techniques for Improved Path Planning Efficiency. Mathematics (2227-7390): 12 12, pp(1787-1807), 2024.
- Ahmed Douzi; Róbert Szabolcsi; Judit Lukács: Cybersecurity and the flight safety of unmanned aerial systems and unmanned aerial vehicles Interdisciplinary Description of Complex Systems (1334-4684 1334-4676): 23 2 pp(95-104), 2025.

Date: August 28 2025, Budapest, Hungary.

Prepared by:

Prof. Dr. habil. Róbert Szabolcsi, DSc.

Psychosocial Support in Emergencies
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Psychosocial Support in Emergencies**	Credit value: 6
Course responsible and lecturer (name, academic title): Dr. Sáfár Brigitta PhD	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 50% - 50% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** case presentations and case study analyses	
Form of assessment (exam / practical grade / other): Additional (specific) methods of knowledge assessment: presentation	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): -	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
Course objective: to familiarize students with the role of mental health support and psychosocial assistance programs related to disasters and emergencies, and their further impact on the psychosocial well-being of individuals and communities amid changing security challenges. Students will learn about events that affect the psychosocial well-being of individuals, individual coping strategies, and ways to restore psychosocial well-being, as well as the psychosocial needs and psychological balance of individuals, helpers, primary responders, and children as groups with special needs and vulnerabilities, as well as methods for restoring psychological balance.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- WHO (2024). Psychological interventions implementation manual: integrating evidence-based psychological interventions into existing services. Geneva: World Health Organization; 2024. ISBN 978-92-4-008714-9 - IFRC (2020) Guidelines for Caring for Staff and Volunteers in Crises, IFRC Reference Centre for Psychosocial Support, Copenhagen, 2020.	
2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Sáfár B. (2024). A segítők pszichoszociális támogatása katasztrófa- és krízishelyzetekben. Polgári Védelmi Szemle. A Magyar Polgári Védelmi	

Szövetség és a Magyar Polgári Védelmi Tudományos Egyesület mértékadó tudományos folyóirata. XVI. évfolyam Különszám 2024. pp. 439-451. ISSN 1788-2168

- SáfárB. (2024). A pszichoszociális reziliencia fejlesztésének lehetőségei a katasztrófák- és humanitárius krízishelyzetek érintettjeinél. Védelem Tudomány a Katasztrófavédelem Online Szakmai, tudományos folyóirata, 8(klsz). Elérés forrás: https://ojs.mtak.hu/index.php/vedelemtudomany/article/view/14877

Date: 13. September, 2025.

Prepared by:

Dr. Sáfár Brigitta PhD

Requirements and quality in safety-critical automotive system design
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Requirements and quality in safety-critical automotive system design**	Credit value: 6
Course responsible and lecturer (name, academic title): Lázár-Fülep, Tímea, PhD	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / **Optional subject**	
Proportion of theoretical and practical content, "Training character": 80 % - 20 % theory - practice	
Type of class: lecture / seminar / practice / **consultation** and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** e.g. case presentations and case study analyses, project work, others... project work preparation of a paper tailored to the given research area	
Form of assessment (**exam** / practical grade / other): professional essay Additional (specific) methods of knowledge assessment:	
Curricular placement of the course (which semester): Can be taken in semesters 1-4	
Prerequisites (if any): -	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- Basic principles of automotive requirements and quality, fundamental methods, procedures focusing on safe and reliable safety-critical systems - Applicability of qualitative and quantitative reliability analyses, the role of intelligent vehicle systems, reliability concepts for electronic systems, industrial and sector-specific regulations	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Lázár-Fülep, Tímea: Scientific Research Review on Dependability of Complex Automotive Systems Developed towards Autonomous Driving, PERIODICA POLYTECHNICA TRANSPORTATION ENGINEERING 50:2 pp. 142-145., 4 p. (2022) - Tímea Fülep: Design Methods of Safety-Critical Electronic Automotive Systems - Quality – Requirement – Reliability, LAP Lambert Academic Publishing, 2012	
2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- .	

Date: 10 September 2025

Prepared by: Lázár-Fülep Tímea

Resilience in Emergencies
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Resilience in Emergencies**	Credit value: 6
Course responsible and lecturer (name, academic title): Dr. Sáfár Brigitta PhD	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 50% - 50% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** case presentations and case study analyses	
Form of assessment (exam / practical grade / other): Additional (specific) methods of knowledge assessment: presentation	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): -	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
Course objective: to familiarise students with the concept of resilience, its characteristics, the programmes that serve it, and how governmental and non-governmental organisations can contribute to its development. Students will learn about the characteristics of resilience at the individual, community, organisational and global levels, as well as its criteria and development opportunities in relation to emergency situations.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Dr. Sáfár Brigitta: a reziliencia szerepe veszélyhelyzetek során (jegyzet) - IFRC (2021) Roadmap to Community Resilience Vol 2. International Federation of Red Cross and Red Crescent Societies, Geneva, 2021. Elérés: https://preparecenter.org/wp-content/uploads/2023/05/FINAL-Road-Map-to-Community-Resilience-v2_En.pdf	
2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Sáfár, Brigitta: The role of humanitarian assistance in resilience development – an innovative research area. In: Molnár, András (szerk.) First Conference on	

Effective Response. Budapest, Magyarország : Magyar Vöröskereszt (2020) 115 p. pp. 15-23. , 9 p

- Kállai, Krisztina ; Sáfár, Brigitta: A rezíliencia elméletek mint az egyén és a közösségek alapvető képességének vizsgálata a krízishelyzetek és természeti katasztrófák kapcsán. VÉDELEM TUDOMÁNY : KATASZTRÓFAVÉDELMI ONLINE TUDOMÁNYOS FOLYÓIRAT 9 : 3 pp. 45-51. , 7 p. (2024)

Date: 13. September, 2025.

Prepared by:

Dr. Sáfár Brigitta PhD

Safety management in construction
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Safety management in construction**	Credit value: 6
Course responsible and lecturer (name, academic title): Dr. Richárd PETŐ	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 50 % - 50 % theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Teaching methods:** • Site visits • Review of case studies • Discussion of practical methods • Review of legal frameworks and requirements **Methods and (specific) approaches, characteristics used to deliver the course content:** -	
Form of assessment (exam / practical grade / other): Colloquium, or alternatively, a research paper prepared during the semester may replace the colloquium. Additional (specific) methods of knowledge assessment: During the discussion of case studies, practical methods, and legal requirements.	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): None	
Course description: - The aim of the course is to identify risks and, through the interrelations of professional fields, propose solutions for risk management. - The construction industry is a sector where (depending on the type of facility) a wide range of professions are involved. Is the project related to general, high-priority, or even critical infrastructure? Questions and risks concerning security services, occupational safety, fire safety, environmental protection, cybersecurity, and property protection almost inevitably arise. What should be managed, and how? The answers can be found through the legal regulatory framework and the chosen and applied security policy.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN): - Act XCIII of 1993 on Occupational Safety	

- Act LXXXIV of 2024 on the Resilience of Critical Organizations - Decree No. 54/2014 (XII. 5.) BM on the National Fire Safety Regulations - Act CXXXIII of 2005 on the Rules of Private Security and Private Investigation Services - Act XXIV of 2004 on Firearms and Ammunition - Government Decree No. 707/2021 (XII. 15.) on Activities within the National Construction Supervision and Reporting System and the Construction Industry Monitoring and Reporting System
2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):
- COBIT - ISO 9001 - ISO 45001 - ISO 27001 - MSZ EN 50131 - MSZ EN 50132 - MSZ EN 62676

Date: Budapest, 26.08.2025

Prepared by:

Dr. Richárd PETŐ

Safety of hazardous materials shipments
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Safety of hazardous materials shipments**	Credit value: 6
Course responsible and lecturer (name, academic title): Dr. Tamás BEREK (PhD)	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 60% - 40.% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** e.g. case presentations and case study analyses, project work, others... Lecture using the frontal method, seminar discussing pre-assigned questions with my supervisor.	
Form of assessment (exam / practical grade / other): exam grade Additional (specific) methods of knowledge assessment: The evaluation consists of two parts: firstly, the discussion of the given questions in the seminar, and secondly, the evaluation of a scientific article or conference presentation prepared for the subject.	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): (*typically there are none!*) -	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
• The concept of cargo insurance, its main types, their characteristics. • The range of hazardous materials and equipment, their main, defining characteristics, the relationship and place of cargo safety in asset protection. • Safeguarding and protection of hazardous materials. • International regulation of transportation, the complexity of safeguarding and protection. • Methods, planning, and organization of transportation.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Dr. Berek Lajos: Biztonságtechnika, NKE, Budapest, 2014. http://vtki.uninke.hu/uploads/media_items/biztonsagtechnika.original.pdf - Dr. Berek Lajos, Dr. Berek Tamás, Berek László: Személy- és vagyonbiztonság, Óbudai Egyetem, Budapest, 2016. ISBN 978-615-5460-94-4	
2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	

- Tóth Attila-Tóth Levente: Biztonságtechnika, NKE, Budapest, 2014. ISBN 978-615-5305-56-6
- Christián L,-Major L,- Szabó Cs [szerk.]: Biztonsági vezetői kézikönyv, Ludovika Egyetemi Kiadó, Budapest, 2020. ISBN 978-963-5310-70-8.
- Horváth T. : Mechanikai védelem, mint késleltetés a fizikai védelemben, NKE Budapest, 2021 In. Hadmérnök p 23–32. ISSN 1788-1919 (online) https://doi.org/10.32567/hm.2021.1.2
- Szabó Lajos: Az objektumok biztonsága és az objektumvédelem speciális területe a megelőző védelem, PhD értekezés, ÓE BDI 2021. https://oda.uni-obuda.hu/bitstream/handle/20.500.14044/10329/Szabo_Lajos_ertekezes.pdf?sequence=1&isAllowed=y
- ADR alapismeretek, Veszélyes áruk szállításának szabályozása, BAZ Megyei Katasztrófavédelmi Igazgatóság https://baz.katasztrofavedelem.hu/24104/veszelyesaru-szallitas

Date: 12 september 2025

Prepared by:

Dr. Berek Tamás

Safety of the Design and Use of Machines and Work Tools
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Safety of the Design and Use of Machines and Work Tools**	Credit value: 6
Course responsible and lecturer (name, academic title): **dr. habil Szabó Gyula**	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / **Optional subject**	
Proportion of theoretical and practical content, "Training character": **60% theory – 40% practice**	
Type of class: lecture / seminar / practice / **consultation** and total number of classes in the given semester: 30 classes Methods and (specific) approaches, characteristics used to deliver the course content: **Interpretation of legislation and standards, case study analysis, risk assessment practice, project work.**	
Form of assessment (exam / **practical grade** / other) Additional (specific) methods of knowledge assessment: **Students are required to prepare a report on the safety requirements for the use of a machine or work tool, taking into account their own research field.**	
Curricular placement of the course (which semester): Can be taken in semesters **1–4**	
Prerequisites: **none**	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
• The aim of the course is to enable students to identify, interpret, and apply the relevant regulations and standards for the safe design and use of machines and work tools. • The curriculum covers the directives on machine safety and the minimum safety and health requirements for work equipment, as well as the MSZ EN ISO 12100:2011 standard (Safety of machinery – General principles for design – Risk assessment and risk reduction). • Students will become familiar with the structure of harmonized standards and will process type B and C standards related to their own research area. • The course also includes an introduction to methods of risk assessment for machines and work tools, as well as practical application of these methods.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
• Guide to the application of the Machinery Directive 2006/42/EC • Machinery Regulation (Regulation (EU) 2023/1230) • Hungarian Decree 16/2008 (VIII.30.) NFGM on the safety requirements and conformity certification of machinery • Hungarian Decree 10/2016 (IV.5.) NGM on the minimum safety and health requirements for the use of work equipment	

Safety of the Design and Use of Machines and Work Tools
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

• Legal regulations and standards processed during the course
2–5 most important <u>recommended</u> readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):
- Hungarian legislation: http://njt.hu/ - EU legislation: http://eur-lex.europa.eu/ - Hungarian Standards Institution: http://mszt.hu/ - European Agecy for Safety and Health at Work (EU-OSHA): https://oshwiki.eu/wiki/Main_Page - train4work.eu - Pascal, E., Zunjic, A., Ferreira, P., Michez, B., Szabó, Gy. (2022): Interconnections Between Ergonomics and EU Machinery Directive – A Standpoint of the Federation of European Ergonomics Societies (FEES). IETI Transactions on Engineering Research and Practice, 6(1), 1–14.

Budapest, 21 August, 2025

Prepared by:

dr. habil Gyula Szabó

Security of Domotic Systems
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Security of Domotic Systems**	Credit value: 6
Course responsible and lecturer (name, academic title): Dr. habil. Kollár Csaba PhD.	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 25% - 75% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** 4. getting to know the theoretical professional-scientific framework of the topic (directed literature review) 5. research on the topic using qualitative and/or quantitative methods (e.g.: online, large-scale questionnaire, expert interviews) 6. getting to know the topic in practice (e.g. processing case studies, benchmarking method)	
Form of assessment (exam / practical grade / other): Additional (specific) methods of knowledge assessment: A personalized written assignment (preparation of a scientific-professional study), which focuses on the topic of the doctoral student and the topic of the subject.	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): no prerequisites for pre-studies	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- To get to know the main areas of human-robot interaction, with special regard to human and information security aspects. - An overview of the methods and applications of robotization supported by artificial intelligence in the economic and social spheres. - The historical and technological background of the development of robotization, from cybernetics to the present day. - Learning the methodology of Sheridan scale analysis to evaluate the human-robot division of tasks. - Developing security challenges and risk mitigation solutions to make interactions more secure, as well as the legal-ethical problems and challenges of this. - Preparation of scientific and professional publications to present the acquired knowledge.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Bartneck, Christoph: Human-Robot Interaction. Cambridge, United Kingdom : Cambridge University Press (2024) , 324 p. ISBN: 9781009424233	

- Barfield, Woodrow , Weng, Yueh-Hsuan , Pagallo, Ugo (szerk): The Cambridge Handbook of the Law, Policy, and Regulation for Human–Robot Interaction. Cambridge, United Kingdom : Cambridge University Press (2024) , 888 p. ISBN: 9781009386661
- Kollár, Csaba: Az ember-mesterséges intelligencia interakció kommunikációtudományi kérdései. In: Konczosné, Szombathelyi Márta; Balogh, Gábor; Jarjabka, Ákos (szerk.) Kommunikáció - Gazdaság - Kultúra - Nyelv : 50 éve a közgazdász képzés szolgálatában. Tiszteletkötet Borgulya Istvánné részére. Pécs, Magyarország : Pécsi Tudományegyetem Közgazdaságtudományi Kar Vezetés- és Szervezéstudományi Intézet (2022) 310 p. pp. 58-69. , 12 p.

2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

- Kollár, Csaba: A biztonság fontosabb fogalmai. BIZTONSÁGTUDOMÁNYI SZEMLE 7 : 1 pp. 15-23. , 9 p. (2025)
- Kollár, Csaba (kézirat): A szerző 2016/2017-ben a Hadtudomány folyóiratban megjelent tanulmányainak aktualizált és megjegyzésekkel kiegészített változata, (2025).
- Kollár, Csaba: A biztonság megjelenése a humán tudományokban (3. rész) BIZTONSÁGTUDOMÁNYI SZEMLE 6 : 4 pp. 1-14. , 14 p. (2024)

Date: August 14, 2025

Prepared by:

Dr. Dr. habil. Kollár Csaba PhD.

Simulation of Vehicle Dynamics
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Simulation of Vehicle Dynamics**	Credit value: 3
Course responsible and lecturer (Dr. Tamás Szakács associate professor):	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 50% - 50% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** Case presentations and case study analyses, project works	
Form of assessment (exam / practical grade / other): Additional (specific) methods of knowledge assessment:	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites -	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- The course introduces the fundamental principles of vehicle dynamics through simplified rigid-body models, covering topics such as weight distribution, static wheel loads, tire–road interaction, and the effects of geometry and load transfer. Building upon these basics, more advanced vehicle dynamic models are developed to analyze stability properties including understeer, oversteer, and rollover tendencies. - The course also addresses steering geometry (Ackermann angles, camber, caster, and toe-in) and suspension characteristics. Emphasis is placed on deriving analytical relationships that support vehicle design and performance evaluation. - In addition to theoretical modeling, students will gain hands-on experience with vehicle dynamics simulation. The course covers the setup of simulation models, execution of parameter studies, and post-processing of results. Typical driving maneuvers such as cornering, braking, lane-change, and steady-state tests are introduced and simulated. - By the end of the course, students will have acquired fundamental skills in modeling, simulating, and analyzing vehicle dynamics, providing a solid foundation for advanced studies in automotive engineering, chassis control, and active safety systems.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Rajamani, R. – Vehicle Dynamics and Control (Springer, 2012) ISBN 978-1-4614-1432-2	

Simulation of Vehicle Dynamics
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

- Hans B. Pacejka – Tyre and Vehicle Dynamics ISBN 978-1-4614-1432-2
2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):
- https://siva.banki.hu/~szakacs/segedanyagok/0910/JDEN/JDEN.html - Gillespie, T. D. – Fundamentals of Vehicle Dynamics (SAE, 1992)

Date: 10.9.2025.

Prepared by:

Dr. Tamás Szakács

SPSS software application in statistics
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **SPSS software application in statistics**	Credit value: 6
Course responsible and lecturer (name, academic title): Regina Zsuzsánna Reicher, Ph.D.	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": …40…% - …60...% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** e.g. case presentations and case study analyses, project work, others... Within the framework of the course, data processing using Excel and SPSS software as part of a project.	
Form of assessment (exam / practical grade / other): Additional (specific) methods of knowledge assessment: Presentation of data processing and data interpretation in the form of a study. Preparation of a publishable study closely related to the candidate's topic. Full-length conference presentation in English or Hungarian, or publication in a scientific journal in English or Hungarian.	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): -	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- Doctoral candidates learn the methods of processing and analysing data collected during research. They will learn how to apply the procedures studied in theory using SPSS software. The aim is to enable them to solve research problems using univariate and multivariate methods. The course also aims to familiarise candidates with the methods needed to study and analyse the quantifiable implications of economic and business phenomena. - During the course, PhD students will be introduced to the possibilities of SPSS software in quantitative research. They will explore the possibilities of descriptive statistical calculations and gain insight into the various methods of correlation analysis. They will learn about parametric and non-parametric procedures. Where possible, they will also carry out multivariate analyses (regression analysis, factor analysis, cluster analysis) if the type of research and the purpose of the thesis requires it..	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Brian C. Cronk (2019) How to Use SPSS®: A Step-By-Step Guide to Analysis and Interpretation 11th Edition	

- David Robinson (2024) SPSS Made Easy: A Practical Guide to Statistical Analysis for Students and Researchers (ebook)
- Andy Field (2024) Discovering Statistics Using IBM SPSS Statistics Sixth Edition
- Sabine Landau (2003) A Handbook of Statistical Analyses Using SPSS
- https://www.academia.dk/BiologiskAntropologi/Epidemiologi/PDF/SPSS_Statistical_Analyses_using_SPSS.pdf

2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

- James O. Aldrich (2019) Using IBM® SPSS® Statistics: An Interactive Hands-On Approach SAGE Publications, Inc
- Julie Pallant (2020) SPSS Survival Manual A step by step guide to data analysis using IBM SPSS (ebook)
- William E. Wagner, III (2019)Using IBM® SPSS® Statistics for Research Methods and Social Science Statistics, California State University, Dominguez Hills, USA

Date: 15. September 2025

Prepared by:

Regina Zsuzsánna Reicher, PhD.

Statistics and data visualisation in Python
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Statistics and data visualisation in Python**	Credit value: 6
Course responsible and lecturer (name, academic title): Dr. habil. Gábor Kiss PhD.	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 50 % - 50% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** During the semester, we perform statistical analyses on various data sets and prepare data visualizations. At the end of the semester, students must complete an analysis of the data collected during their research as part of a project. The end-of-semester assessment is based on the quality of this analysis.	
Form of assessment (exam / practical grade / other): Additional (specific) methods of knowledge assessment:	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): -	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- A well-chosen statistical analysis can support or justifiably reject a research hypothesis. In order to understand which statistical analysis can be applied to the data set at hand, it is necessary to understand the possible methods of analysis and their requirements. This is what the subject aims to help us with. - The course will introduce you to the Python programming language package for statistical analysis and the different methods of statistical analysis (reliability, statistical decision analysis, hypothesis testing, non-parametric tests, regression analysis, correlation analysis, etc.). - We will learn how to use these statistical methods to confirm or justify the rejection of our hypotheses and the resulting new hypothesis. -	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- . Campesato O. Statistics Using Python, 2023, ISBN: 9781683928*805* - Lau S. Learning Data Science. Programming and Statistics Using Python, 2023, ISBN: 9781098112998	

Date: 02.09.2025.

Prepared by: Dr. habil. Gábor Kiss

The effects of the use of artificial intelligence on society
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **The effects of the use of artificial intelligence on society**	Credit value: 6
Course responsible and lecturer (name, academic title): Dr. Imre Négyesi PhD	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 100% - 0% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** - Lectures that promote theoretical foundation. - Processing of case studies. - Preparing analyses.	
Form of assessment (exam / practical grade / other): practical grade Additional (specific) methods of knowledge assessment: preparing a paper to be submitted	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): *none*	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- The aim of the research is to examine the application of artificial intelligence in terms of its effects on society, using analyses and comparative assessments. - To prepare analyses on the legal foundations, moral and ethical issues of artificial intelligence. - To propose solutions that meet the requirements in a given (selected) application area based on the exploration of the effects on society.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Peter Norvig-Stuart Russel: Artificial Intelligence Volume I. – In a modern approach, Taramix Publishing Ltd. 584 pages, ISBN 97886155186769 (2023) - Imre Négyesi: The Possibilities of the Military Use of Artificial Intelligence: Volume One. Budapest: HM Zrínyi Media Public Nonprofit Ltd., 232 p. (2022) - Imre Négyesi: The Possibilities of the Military Use of Artificial Intelligence (Volume II) Artificial Intelligence in the Art of War and Wars of the 21st Century, Zrínyi Publishing House, ISBN 9789633279069 (2023) - Imre Négyesi: Social issues of military use of artificial intelligence DEFENSE REVIEW: THE CENTRAL JOURNAL OF THE HUNGARIAN DEFENSE (2060-1506 2732-3226): 149 1 pp 133-144 (2021)	

- Imre Négyesi: Social and ethical issues of the military use of Artificial Intelligence and effects on democracies SCIENTIFIC JOURNAL OF THE MILITARY UNIVERSITY OF LAND FORCES (2544-7122 2545-0719): 215 1 pp 85-102 (2025)

2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

- Peter Norvig-Stuart Russel: Artificial Intelligence Volume II. - In a modern approach, Taramix Publishing Ltd.840 pages, ISBN 9786155186943 (2023)
- Imre Négyesi: Social and Ethical Issues of the Military Use of Artificial Intelligence, ADVANCED SCIENCES AND TECHNOLOGIES FOR SECURITY APPLICATIONS (1613-5113 2363-9466): 2024 pp 421-430 (2024)
- Imre Négyesi: Social and ethical issues of artificial intelligence, DEFENSE REVIEW: THE CENTRAL JOURNAL OF THE HUNGARIAN DEFENSE (2060-1506 2732-3226): 151 4 pp 6-18 (2023)
- Imre Négyesi: The impact of the military application of artificial intelligence on democracies, MILITARY SCIENCE: JOURNAL OF THE HUNGARIAN MILITARY SCIENCE SOCIETY (1215-4121 1588-0605): 32 2 pp 74-85 (2022)
- Imre Négyesi: The potential of cognitive artificial intelligence for mission-oriented military decision-making, REVISTA ACADEMIEI FORTELOR TERESTRE/LAND FORCES ACADEMY REVIEW (2247-840X 1582-6384): 2024 4. pp 473.-480. (2024)

Date: Budapest, 31-08-2025
Prepared by:
Dr. Imre Négyesi

The impact of personal identification on security
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **The impact of personal identification on security**	Credit value: 6
Course responsible and lecturer (name, academic title): Jozsef Balla Phd	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 60 % - 40 % theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** After mastering the theoretical foundations, personal identification based on traditional anatomical features is practiced using tests prepared by the instructor.	
Form of assessment (exam / practical grade / other): colloquium exam Additional (specific) methods of knowledge assessment: **Requirements for class attendance, acceptable absences, possibility of making up for absences:** Attendance is mandatory for 100% of classes. In case of unexcused absence, signature must be refused. In case of justified absence, the student is obliged to obtain the lecture material in order to make up for it and prepare independently from it. Absences exceeding 30%, regardless of whether justified or unexcused, will result in refusal to sign. **Mid-term assignments and knowledge assessment procedure:** During the semester, the student writes 1 closed-door paper and 1 submitted essay, and during the semester, 1 submitted essay or study. The closed-door paper is evaluated on a five-point scale: 61% is sufficient, 71% is average, 81% is good, and 91% is excellent. The essay is also evaluated on a five-point scale. The essay is not satisfactory if it contains factual errors, is not related to the given/chosen topic, if the title and content are not consistent, or the presenter cannot justify his/her own statements. The unwritten closed-door paper can be made up once at a time specified by the instructor. The insufficient closed-door paper can be corrected once at a time specified by the instructor; in case of failure, the signature may be refused. In the event of the unsuccessful completion of the remedial thesis, the instructor may, in reasonable circumstances, allow the student to submit an oral report on the given topic until the tenth working day before the end of the academic period. **Conditions** for obtaining the signature: The condition for obtaining the signature is attendance at classes and at least satisfactory completion of the specified mid-term assignments. **Assessment:** Exam: written or oral colloquium. Grades may be awarded based on the closed-door paper written during the semester and the submitted essay. During the	

exam, the content of the subject taught during the semester, the material from the class, and the mandatory literature must be presented.

Conditions for obtaining credits: The condition for obtaining credits is obtaining the signature and at least satisfactory exam grade.

Curricular placement of the course (which semester): Can be taken in semesters 1–4

Prerequisites (if any):*there is none*

Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired

Course Objective:
The purpose of personal identification is to determine whether the individual presenting an identity document is indeed the same person to whom the document was issued. This activity serves as a security-enhancing function, for example, within the European Union and the Schengen Area. Personal identification must provide an immediate response regarding identity or discrepancy at the location of the inspection, as an integral part of the verification process. Personal identification holds significant importance both in public administration (e.g., criminal, law enforcement, migration) and in the private sector (e.g., banking, business, security).

Students will learn and master the methods of performing traditional personal identification based on anatomical features. They will learn about the objective and subjective factors influencing personal identification and their ability-enhancing or ability-reducing effects on the identification process and the security of the European Union and the Schengen area. The aim of the training is to provide participants with the knowledge that ensures a conscious identification process instead of an intuitive personal identification.

Course Content, Description:

1. The concept and purpose of personal identification.
2. Distinction between personal identification for law enforcement and for forensic purposes.
3. Objective and subjective factors influencing personal identification from the perspective of the identifier and the identified person.
4. The role and significance of anatomical features (shape and relative position of the head, nose, eyes, mouth, ears) in personal identification; their recognition and examination.
5. Methods of personal identification and the procedure of their practical application.
6. The importance of personal identification in the security of the European Union and the Schengen Area.

2–5 most important <u>required</u> readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

1. Balla József: The Security-Enhancing Effect of Travel and Identity Documents Containing Biometric Data on Border Security and Public Safety, Dialóg Campus Kiadó, Budapest, 2019., - p. 190, ISBN 978-615-6020-50-5 (nyomtatott) ISBN 978-615-6020-51-2 (elektronikus)
2. Balla József: Travel Documents at the Beginning and End of the 20th Century, or 110 Years of Travel Documents. Határrendészeti Tanulmányok, 13. évf. 2. sz., 2016., - p. 30-44.
3. Balla József: Border Traffic Control Technology vs. Public Document Forgery, Határrendészeti Tanulmányok, 16. évf. 1. sz., 2019., - p. 5-58.
4. Zsákai Lénárd - Balla József – Herczeg Mónika - Vájlok László - Vedó, Attila - Pető, János : Examination and Evaluation of the Operation of the Automated Border Control System, Belügyi Szemle (2023), – p 303-315. , 13 p.

2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

1. Anti Csaba szerk.: The Personal Description. Budapest, Semmelweis Kiadó. (2017.), (ISBN: 978-963-331-409-8)
2. Bencsik Péter: Between East and West: State Borders, Travel Documents, and Border Crossing in Hungary and Czechoslovakia (1945-1989), Budapest, Magyar Tudományos Akadémia Bölcsészettudományi Kutatóközpont Történelemtudományi Intézet. (2019.) ISBN 978 963 41 6176 9.

Date: Budapest, August 17, 2025.

Prepared by:

Jozsef Balla PhD

The methodology of the process for obtaining scientific doctoral (PhD) degree
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **The methodology of the process for obtaining scientific doctoral (PhD) degree**	Credit value: 6
Course responsible and lecturer (name, academic title): Tibor FARKAS (PhD)	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 60 % - 40 % theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** - Case studies and case analyses: Presentation and examination of concrete PhD dissertations and defense processes, analyzing their strengths and weaknesses. - Simulations, role plays, and peer-review: Students model the situations of the internal discussion and the public defense, taking on the roles of presenter, opponent, and committee member. In addition, they provide feedback on each other's work, thereby practicing scientific critical evaluation. - Debates and roundtable discussions: Addressing scientific ethical dilemmas, publication challenges, and different models of cooperation between supervisor and doctoral candidate.	
Form of assessment (exam / practical grade / other): Additional (specific) methods of knowledge assessment: The evaluation of students' performance is based on multiple criteria. During the course, they are required to participate in simulations of preparation for the internal discussion and the public defense, where they present their own research and apply the argumentative, presentation, and debating techniques they have learned. In addition, active participation is expected in professional debates, workshops, and group assignments. The evaluation of students' performance is based on multiple criteria. During the course, they are required to participate in simulations of preparation for the internal discussion and the public defense, where they present their own research and apply the argumentative, presentation, and debating techniques they have learned. In addition, active participation is expected in professional debates, workshops, and group assignments.	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): *none*	
Course description: The aim of the course is to prepare students for the process of obtaining a scientific degree and for the effective presentation and defense of their research results. Throughout the course, students will become familiar with the main stages of doctoral training and degree acquisition, along with their respective	

requirements. The development of scientific argumentation and presentation skills is essential for the successful conduct of internal discussions and public defenses. Furthermore, the course aims to ensure that students confidently navigate the ethics and procedures of degree acquisition and collaborate effectively with their supervisors during the research and dissertation process.
- Tasks and requirements for the completion of doctoral studies; requesting the absolutorium (final certificate). - Structure of the doctoral (PhD) dissertation; mandatory content and formal elements (organization, references, etc.). - Preparation and conditions of the internal discussion; cooperation with the supervisor in organizing and conducting the internal defense. - Requirements and tasks of the degree acquisition procedure; related documents and performance indicators. - Process of the degree acquisition procedure; roles of participants, bodies, councils, and timeframes. - Preparation and conditions of the public defense; cooperation with the supervisor in organizing and conducting the public defense. - Ethical issues of the internal discussion and the public defense.
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):
- Act CCIV of 2011 on National Higher Education - Doctoral and Habilitation Regulation of Óbuda University https://uni-obuda.hu/wp-content/uploads/2023/10/Egyetemi_Doktori_es_Habilitacios_Szabalyzat_Angol.pdf - Curriculum of the Doctoral School on Safety and Security Sciences https://bdi.uni-obuda.hu/wp-content/uploads/2023/10/Cirruculum-of-the-Doctoral-School-on-Safety-and-Security-Sciences-1-September-2023.pdf
2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):
- W. Tan, Research Methods: A Practical Guide for Students and Researchers, 2nd ed. Singapore: World Scientific Publishing, 2022. - Parul Gandhi, N.K. Chadha: A Complete Guide to Research and Ph.D Journey, The Readers Paradise, 2022 - Doctoral School Quality Assurance Plan https://bdi.uni-obuda.hu/wp-content/uploads/2023/10/Quality-Assurance-Plan-Doctoral-School.pdf - Rules of Operation of the Doctoral School on Safety and Security Sciences

The methodology of the process for obtaining scientific doctoral (PhD) degree
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

- https://bdi.uni-obuda.hu/wp-content/uploads/2023/10/Rules-of-Operation-of-the-Doctoral-School-on-Safety-and-Security-Sciences-1-September-2023.pdf
- Additional documents of the Doctoral School on Safety and Security Sciences https://bdi.uni-obuda.hu/en/downloadable-documents/

Date: Budapest, September 1, 2025

Prepared by:

Tibor FARKAS (PhD)

The Safety Aspect of Human-Robot Interaction
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **The Safety Aspect of Human-Robot Interaction**	Credit value: 6
Course responsible and lecturer (name, academic title): Dr. habil. Kollár Csaba PhD.	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 25% - 75% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** 7. getting to know the theoretical professional-scientific framework of the topic (directed literature review) 8. research on the topic using qualitative and/or quantitative methods (e.g.: online, large-scale questionnaire, expert interviews) 9. getting to know the topic in practice (e.g. processing case studies, benchmarking method)	
Form of assessment (exam / practical grade / other): Additional (specific) methods of knowledge assessment: A personalized written assignment (preparation of a scientific-professional study), which focuses on the topic of the doctoral student and the topic of the subject.	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): no prerequisites for pre-studies	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- To get to know the main areas of human-robot interaction, with special regard to human and information security aspects. - An overview of the methods and applications of robotization supported by artificial intelligence in the economic and social spheres. - The historical and technological background of the development of robotization, from cybernetics to the present day. - Learning the methodology of Sheridan scale analysis to evaluate the human-robot division of tasks. - Developing security challenges and risk mitigation solutions to make interactions more secure, as well as the legal-ethical problems and challenges of this. - Preparation of scientific and professional publications to present the acquired knowledge.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Bartneck, Christoph: Human-Robot Interaction. Cambridge, United Kingdom : Cambridge University Press (2024) , 324 p. ISBN: 9781009424233	

- Barfield, Woodrow , Weng, Yueh-Hsuan , Pagallo, Ugo (szerk): The Cambridge Handbook of the Law, Policy, and Regulation for Human–Robot Interaction. Cambridge, United Kingdom : Cambridge University Press (2024) , 888 p. ISBN: 9781009386661
- Kollár, Csaba: Az ember-mesterséges intelligencia interakció kommunikációtudományi kérdései. In: Konczosné, Szombathelyi Márta; Balogh, Gábor; Jarjabka, Ákos (szerk.) Kommunikáció - Gazdaság - Kultúra - Nyelv : 50 éve a közgazdász képzés szolgálatában. Tiszteletkötet Borgulya Istvánné részére. Pécs, Magyarország : Pécsi Tudományegyetem Közgazdaságtudományi Kar Vezetés- és Szervezéstudományi Intézet (2022) 310 p. pp. 58-69. , 12 p.

2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

- Kollár, Csaba: A biztonság fontosabb fogalmai. BIZTONSÁGTUDOMÁNYI SZEMLE 7 : 1 pp. 15-23. , 9 p. (2025)
- Kollár, Csaba (kézirat): A szerző 2016/2017-ben a Hadtudomány folyóiratban megjelent tanulmányainak aktualizált és megjegyzésekkel kiegészített változata, (2025).
- Kollár, Csaba: A biztonság megjelenése a humán tudományokban (3. rész) BIZTONSÁGTUDOMÁNYI SZEMLE 6 : 4 pp. 1-14. , 14 p. (2024)

Date: August 14, 2025

Prepared by:

Dr. Dr. habil. Kollár Csaba PhD.

The South-South Cooperation with a special focus on its African – Latin American dimensions
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **The South-South Cooperation with a special focus on its African – Latin American dimensions**	Credit value: 6
Course responsible and lecturer (name, academic title): Dr. Dávid Vogel PhD	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 100% - 0% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** Review of literature review and theoretical background, case presentations, case study analyses, critical current case examination, debate.	
Form of assessment (exam / practical grade / other): Additional (specific) methods of knowledge assessment: -	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): none	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- The primary goal of the subject 'The South-South Cooperation with a special focus on its African – Latin American dimensions' is to give the students a comprehensive picture about the historic background of the cooperation, more particularly about the fields of cooperation of Africa and Latin America. - To introduce the main players, their evolution and roles, as well as current activities, changing the international security dynamics. - Throughout the course – primarily during the classes dealing with current matters – student have the chance to articulate their views on today's opportunities and challenges and on the possible ways for development.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	

- Kirabira, T. R. (2025). *Transnational Networks and Justice in the Global South*. Springer Singapore. ISBN 9789819531363
- Reinalda, B., & Louis, M. (Eds.). (2025). *Routledge Handbook of International Organization*. Routledge, 698 Pages, ISBN 9781032540696.
- Venthan, T., Ananthavinayagan, A., Shenoy, V. (Eds.) (2024). *The Wretched of the Global South.* Springer Singapore, 278 pages, ISBN 9789819992744, https://doi.org/10.1007/978-981-99-9275-1.
- Stapel, S. (2022). *Regional Organizations and Democracy, human rights, and the rule of law: The African Union, Organization of American States, and the diffusion of institutions*. Palgrave Macmillan. 349 pages, ISBN 9783030903978, https://doi.org/10.1007/978-3-030-90398-5.
- Tickner, A. B., & Smith, K. (Eds.) (2020). *International Relations from the Global South: Worlds of Difference*. Routledge. 368 pages, ISBN 9781315756233, https://doi.org/10.4324/9781315756233
- Dargin, J. (Ed.) (2013). *Rise of the Global South – Philosophical, Geopolitical And Economic Trends of the 21st Century*. World Scientific Pub Co Inc, 452 pages, ISBN 9789814397803, https://doi.org/10.1142/8430.

2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

- Sachdeva, M., Sidorov, P. (2025). *The Global South: A strategic approach to the world's fourth bloc*. Deutsche Bank Research Institute. 22 pages. https://www.dbresearch.com/PROD/RI-PROD/PDFVIEWER.calias?pdfViewerPdfUrl=PROD0000000000586721
- Mazzega, P., Rugmini, D. M., & Barros-Platiau, A. F. (2025). Where is the "Global South" located in scientific research? *Earth System Governance*, 25. https://doi.org/10.1016/j.esg.2025.100269.
- Brun, É. (2023, December 13). The Meanings of the (Global) South From a Latin American Perspective. *Oxford Research Encyclopedia of International Studies*. https://doi.org/10.1093/acrefore/9780190846626.013.800
- Falola, T., Thomas, C. (2014). *Securing Africa Local Crises and Foreign Interventions*. Routledge, ISBN 9781032924311, https://doi.org/10.4324/9780203583852.
- Braveboy-Wagner, J. A. (2009). *Institutions of the Global South.* Routledge, 272 pages, ISBN 9780415365918.

Date: Budapest, 05.09.2025
Prepared by:
David Vogel

The state and situation of the African military industry, the interests and role of the great powers
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **The state and situation of the African military industry, the interests and role of the great powers**	Credit value: 6
Course responsible and lecturer (name, academic title): Prod. Dr. János Besenyő	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 100% theory	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** Classroom lectures, case presentations and case studies, participation in project work (article writing).	
Form of assessment (exam / practical grade / other): Additional (specific) methods of knowledge assessment: The student has the opportunity to publish in the English-language, international journal operated by the African Research Institute of the Doctoral School of Security Studies (Journal of Central and Eastern European African Studies/JCEEAS)	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): -	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- To present and describe the armed forces of African states, their preparedness, equipment, possible military-industrial background, and capacity. - To describe those states outside the continent that supply weapons and other military-industrial equipment to African countries, economic cooperation, and methods of compensating for the price of weapons. - We will separately address the issue of how external actors use their "supplier status" to influence the domestic and foreign policy of given countries, regions, and even the continent itself, and what impact they have on the security of African countries and on various conflicts. - To examine what opportunities Hungary or other smaller countries have in the African military industry, and what areas are possible where it is possible to establish cooperation based on mutual benefits.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Thomas-Durell Young: The Economics of Defense Industry: Contemporary Prospects and Challenges, New York, Routledge, 2023, ISBN: 9781000970791, 228 pages.	

- Keith Hartley, Jean Belin: The Economics of the Global Defence Industry, New York, Routledge, 2019, ISBN: 9780429882692, 640 pages.
- Frederic S Pearson: The Global Spread Of Arms: Political Economy Of International Security, New York, Routledge, 2018, ISBN: 9780429976124, 161 pages.
- Nayantara Hensel: The Defense Industrial Base: Strategies for a Changing World, New York, Routledge, 2016, ISBN: 9781317036159, 304 pages.
- Andrew T. H. Tan: The Global Arms Trade: A Handbook, New York, Routledge, 2014, ISBN: 9781136969546, 391 pages.
- Dan Henk: South Africa's armaments industry: continuity and change after a decade of majority rule, University Press of America, 2006, ISBN: 9780761834816, 199 pages.

2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

- Bruce E. Arlinghaus: Military Development In Africa: The Political And Economic Risks Of Arms Transfers, New York, Routledge, 2019, ISBN: 9780429725104, 316 pages.
- Rachel Stohl, Suzette Grillot: The International Arms Trade, Cambridge, Polity Press, 2013, ISBN: 9780745654188, 280 pages
- Jacques S. Gansler: Democracy's Arsenal: Creating a Twenty-first-century Defense Industry, Massachusetts, MIT Press, 2011, ISBN: 9780262072991, 432 pages.
- Richard Bitzinger: Towards a Brave New Arms Industry? New York, Routledge, 2014, ISBN: 9781136052804, 120 pages.
- Armin Krishnan: War as Business: Technological Change and Military Service Contracting, Oxon, Ashgate Publishing, Ltd., 2008, ISBN: 9780754671671, 207 pages.

Date: 14.08.2025.

Prepared by:

Prof. Dr. János Besenyő

The Use of Biometric Data for the Security of the European Union and the Schengen Area
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **The Use of Biometric Data for the Security of the European Union and the Schengen Area**	Credit value: 6
Course responsible and lecturer (name, academic title): Jozsef Balla Phd	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 60 % - 40 % theory – practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** After learning about the possibilities of personal identification based on biometric data, the investigation of device- and method-specific identification possibilities is carried out as part of a project assignment.	
Form of assessment (exam / practical grade / other): colloquium exam Additional (specific) methods of knowledge assessment: **Requirements for class attendance, acceptable absences, possibility of making up for absences:** Attendance is mandatory for 100% of classes. In case of unexcused absence, signature must be refused. In case of justified absence, the student is obliged to obtain the lecture material in order to make up for it and prepare independently from it. Absences exceeding 30%, regardless of whether justified or unexcused, will result in refusal to sign. **Mid-term assignments and knowledge assessment procedure:** During the semester, the student writes 1 closed-door paper and 1 submitted essay, and during the semester, 1 submitted essay or study. The closed-door paper is evaluated on a five-point scale: 61% is sufficient, 71% is average, 81% is good, and 91% is excellent. The essay is also evaluated on a five-point scale. The essay is not satisfactory if it contains factual errors, is not related to the given/chosen topic, if the title and content are not consistent, or the presenter cannot justify his/her own statements. The unwritten closed-door paper can be made up once at a time specified by the instructor. The insufficient closed-door paper can be corrected once at a time specified by the instructor; in case of failure, the signature may be refused. In the event of the unsuccessful completion of the remedial thesis, the instructor may, in reasonable	

circumstances, allow the student to submit an oral report on the given topic until the tenth working day before the end of the academic period.

Conditions for obtaining the signature: The condition for obtaining the signature is attendance at classes and at least satisfactory completion of the specified mid-term assignments.

Assessment: Exam: written or oral colloquium. Grades may be awarded based on the closed-door paper written during the semester and the submitted essay. During the exam, the content of the subject taught during the semester, the material from the class, and the mandatory literature must be presented.

Conditions for obtaining credits: The condition for obtaining credits is obtaining the signature and at least satisfactory exam grade.

Curricular placement of the course (which semester): Can be taken in semesters 1–4

Prerequisites (if any):*there is none*

Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired

Course Objective:
Ensuring the internal security of the European Union and the safety of the Schengen Area is a shared interest and responsibility of the member states. To establish a person's identity beyond doubt, the use of biometric data is essential, as one of the modern procedures adapted to the advancements of the 21st century.

Students will learn about and master the range of biometric data applicable in law enforcement personal identification, as well as the possibilities and mechanisms for their verification by authorities. They will receive information on systems used to enhance security in the Schengen Area that contain biometric data and support identification based on these elements. The course aims to provide students not only with knowledge of the applications of biometric data but also with up-to-date information on the law enforcement-specific device- and method-related requirements for their use**.**

Course Content, Description:

7. The emergence of biometrics in the service of freedom, security, and the rule of law.
8. Distinction between biometric personal identification for law enforcement and forensic purposes.
9. Methods of biometric personal identification used in law enforcement.
10. The presence of biometric data in travel and identity documents.
11. The use of biometric data in the Visa Information System.
12. The use of biometric data in the Schengen Information System.

The Use of Biometric Data for the Security of the European Union and the Schengen Area
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

13. The use of biometric data in the European Border Surveillance System.
14. Possibilities for verifying biometric data in law enforcement work.

2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

1. Balla József: The Security-Enhancing Effect of Travel and Identity Documents Containing Biometric Data on Border Security and Public Safety, Dialóg Campus Kiadó, Budapest, 2019., - p. 190, ISBN 978-615-6020-50-5 (nyomtatott) ISBN 978-615-6020-51-2 (elektronikus)
2. Zsákai__Lénárd - Balla József – Herczeg__Mónika - Vájlok__László - Vedó, Attila - Pető, János : Examination and Evaluation of the Operation of the Automated Border Control System, Belügyi Szemle (2023), – p 303-315. , 13 p.
3. Frontex: Best Practice Operational Guidelines for Automated Border Control (ABC) Systems, Warsaw, 2016.
4. COUNCIL REGULATION (EC) No 2252/2004 of 13 December 2004 on standards for security features and biometrics in passports and travel documents issued by Member States

2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

1. REGULATION (EC) No 767/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 July 2008 concerning the Visa Information System (VIS) and the exchange of data between Member States on short-stay visas (VIS Regulation)
2. REGULATION (EC) No 1987/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 20 December 2006 on the establishment, operation and use of the second generation Schengen Information System (SIS II)
3. REGULATION (EU) 2017/2226 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 November 2017 establishing an Entry/Exit System (EES) to register entry and exit data and refusal of entry data of third-country nationals crossing the external borders of the Member States and determining the conditions for access to the EES for law enforcement purposes, and amending the Convention implementing the Schengen Agreement and Regulations (EC) No 767/2008 and (EU) No 1077/2011

Date: Budapest, August 17, 2025.

Prepared by:

József Balla PhD

Trust and Security
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Trust and Security**	Credit value: 6
Course responsible and lecturer (name, academic title): Dr. habil. Mizser Csilla Ilona	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 50% - 50% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** combining case studies and relevant scientific literature; participation in an international scientific conference, material prepared for publication during the semester.	
Form of assessment (exam / practical grade / other): exam Additional (specific) methods of knowledge assessment: -	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): -	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
- The aim of the course is to introduce doctoral students to the directions and possibilities of secondary and primary research on trust and security, alternative dispute resolution. The aim is to introduce alternative dispute resolution methods, solve practical issues, legal cases, and examples. The aim is also to conduct research on the subject of alternative dispute resolution, with participation in an international conference and publication as the output condition.	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Kohlhoffer-Mizser Cs., Hernández Zelaya S. L., Puimé Guillén F. , Reyes Reina F.E. What is the price ofthe conflict? Decisions in the light of Hungarian and Spanish alternative dispute resolutions. En Jiří Gregor, Emil Adáme, 21 Proceedings of the 21st International Conference. Ostrava; 2019. 117-119 - Németh, Zs. Konfliktusmegoldó stratégiák a testnevelésben és a sportban. In Bendiner N. (Ed.) Tudomány a Sportoló Nemzetért" Konferenciasorozat. Előadáskivonatok. MSTT: Budapest; 2007. 31-35. - Kohlhoffer-Mizser Csilla: Leader is the person who deals with conflict. Global answers in conflict management In: SHS WEB OF CONFERENCES (2261-2424): 74 pp 1-7 Paper 06011. (2020)	

- Kohlhoffer-Mizser Csilla. Conflict management-resolution based on trust?. (2019) EKONOMICKO-MANAZERSKE SPEKTRUM / ECONOMIC AND MANAGERIAL SPECTRUM 1337-0839 2585-7258 13 1 72-82, 30730961
- Afroogh, S., Akbari, A., Malone, E., Kargar, M., & Alambeigi, H. (2024). Trust in AI: progress, challenges, and future directions. Humanities and Social Sciences Communications, 11(1), 1-30.

2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

- Mizser, Csilla Ilona: Organization and security: public interest disclosures and whistleblowing In: Tomas, Kliestik; Elvira, Nica (szerk.) Globalization and its Socio-Economic Consequences 2024 – Volume II Berlin, Németország: Peter Lang Publishing Group (2025) 884 p. pp. 707-719. , 13 p.
- Kohlhoffer-Mizser Csilla. Mediáció a jogi személyek életében I.. (2016) Megjelent: Vállalkozásfejlesztés a XXI. században VI. pp. 197-210, 3073361 Könyvrészlet/Szaktanulmány (Könyvrészlet)/Tudományos [3073361]
- Cologna, V., Mede, N. G., Berger, S., Besley, J., Brick, C., Joubert, M., ... & Metag, J. (2025). Trust in scientists and their role in society across 68 countries. Nature Human Behaviour, 9(4), 713-730.
- Shahzad, M. F., Xu, S., & Zahid, H. (2025). Exploring the impact of generative AI-based technologies on learning performance through self-efficacy, fairness & ethics, creativity, and trust in higher education. Education and Information Technologies, 30(3), 3691-3716.
- Valgarðsson, V., Jennings, W., Stoker, G., Bunting, H., Devine, D., McKay, L., & Klassen, A. (2025). A crisis of political trust? Global trends in institutional trust from 1958 to 2019. British Journal of Political Science, 55, e15.

Date: Budapest, 15th September, 2025

Prepared by:

Dr. habil. Mizser Csilla Ilona

Validation: applicability of relevant knowledge
COURSE SYLLABUS
Doctoral School on Safety and Security Sciences

Course title: **Validation: applicability of relevant knowledge**	Credit value: 6
Course responsible and lecturer (name, academic title): Jolan Velencei, Phd	
Course classification: Basic course (subjects) in the field of safety and security science/ Research topic related basic course / Optional subject	
Proportion of theoretical and practical content, "Training character": 50% - 50% theory - practice	
Type of class: lecture / seminar / practice / consultation and total number of classes in the given semester: 30 classes **Methods and (specific) approaches, characteristics used to deliver the course content:** - defining a transdisciplinary research strategy - demonstrating the visualisation of existing knowledge through case studies - understanding reflective learning in the research process	
Form of assessment (exam / practical grade / other): oral exam Additional (specific) methods of knowledge assessment: visualization and presentation of the research area on a concept map	
Curricular placement of the course (which semester): Can be taken in semesters 1–4	
Prerequisites (if any): -	
Course description: Objective of the course, a concise yet informative description of the knowledge to be acquired	
The course aims to teach how to quickly evaluate the overwhelming amount of knowledge arriving at us and to understand the transdisciplinary approach in scientific research. - Basic concepts of scientific research (goals, questions, hypotheses, methods) - Defining the taxonomy necessary to establish the conceptual framework of research - Understanding and applying visualisation techniques within the research field - The applicability of artificial intelligence in scientific research - Tips to enhance the written and oral "art" of presentations	
2–5 most important required readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):	
- Dörfler, V., Baracskai, Z., Velencei, J., Stierand, M. & Miralles, M. (2022). Validating knowledge: a methodological issue of decision making. In: 36th Annual Conference of the British Academy of Management, 2022-08-31 - 2022-09-02, Alliance Manchester Business School. https://strathprints.strath.ac.uk/92620/ - Matthies, A. L., Hermans, K., & Leskošek, V. (2022). Applying transdisciplinary sustainability transitions research in international social work doctoral training. Social Work Education, 41(7), https://doi.org/10.1080/02615479.2022.2105316	

- Obreja, D. M., Rughiniș, R., & Rosner, D. (2023). Mapping the conceptual structure of innovation in artificial intelligence research: A bibliometric analysis and systematic literature review. Journal of Innovation & Knowledge, 9(1), https://doi.org/10.1016/j.jik.2024.100465

2–5 most important recommended readings (textbooks, study materials) with bibliographic data (author, title, publication details, pages, ISBN):

- Carr, Nicholas (2025). Superbloom - How Technologies of Connection Tear Us Apart. Norton & Company. ISBN: 1324064617
- Popper, Karl (2002). Unended Quest: An Intellectual Autobiography. London: Routledge. ISBN 9780415285902
- Mollick, Ethan (2024). Co-Intelligence. Living and Working with AI. Portfolio. ISBN: 9780593716717

Date: Budapest, August 22, 2025

Prepared by:

Jolan Velencei, PhD (signature)