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| **Lecturer** | Prof. Sang Chul Park |
| **PJO\* Offer** | YES |
| **PJOE\*Offer** | YES |
| **Major, year, level of studies for PJO (\*required)** | 2nd cycle preferably |
| **Semester of 2022/2023** | Summer |

\* PJO – course in foreign language for Polish students / PJOE – course in foreign language for Polish and Erasmus+ students  
\*\* leave appropriate

BASIC INFORMATION ABOUT THE SUBJECT (INDEPENDENT OF THE CYCLE)

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| **Module name** | **Emerging Digital Economy in the Fourth Industrial Revolution Era** |
| **Erasmus code** |  |
| **ISCED code** | 0311 |
| **Language of instruction** | English |
| **Website** | <https://www.umcs.pl/en/courses-in-english-2021-2022,21582.htm>  (for PJOE) |
| **Prerequisites** | Foreign language capacity and social science background |
| **ECTS points hour equivalents** | Contact hours (work with an academic teacher): 15  Total number of hours with an academic teacher: 15  Number of ECTS points with an academic teacher: 1,5 Non-contact hours (students' own work): 15 Total number of non-contact hours: 15 Number of ECTS points for non-contact hours: 1,5  Total number of ECTS points for the module: 3 |
| **Educational outcomes verification methods** | Lecture and presentation, discussion, Q & As |
| **Description** | The Fourth Industrial Revolution (FIR) was expected to start around 2020 by developing Artificial Intelligent (AI), Internet of Things (IoT), big data, and advanced robots that are core technologies for the FIR. Many scholars expect the FIR based on digitization can be accelerated due to the unexpected the COVID-19 Pandemic that took place in 2020 and is still an ongoing process in 2022. The pandemic is divided into three waves such as health issues, economic issues, and implementing process of the FIR. The third wave is being fostered by the pandemic and will impact on our lives much stronger than the other two waves in the long run. The pandemic has resulted in telework from home as a new work phenomenon that will change in the organization of work time and show a clear trend of expansion in the future.  By using the above core technologies, the FIR enables the two characteristics representing hyper automation and hyper connectivity. The former allows more advanced robots and AI to produce outputs, analyze results, and make complex decisions by adopting conclusions to given environmental factors. The latter based on monitoring, analyzing, and digitizing connect between human and human, human and machine as well as machine and machine. As a result, hyper automation can reduce low and medium skill jobs that are highly repetitive and routine. Hyper connectivity enables universal, global and close to instant communication that opens up economic supply side. These two characteristics contribute to communicating between and among governments, firms, humans, and machines that creates cyber physical system (CPS) connecting techno-sphere, the natural world, and the human world between the real and cyber world.  Smart cities are regarded as the highest level of the Fourth Industrial Revolution based on the hyper automation and the hyper connectivity starting with smart phones, smart homes, and smart factories. In the reality, these three levels have already been commercialized in productions and services. Realizing smart cities in the world means that the Fourth Industrial Revolution is completed in the reality of our daily life in the near future. Accordingly, the overall essence and motivation to build smart cities are to facilitate the highest quality of life to their residents, while optimizing all resources that smart cities require. By doing that, smart cities are able to strengthen the social and economic development that contributes to generating the overall sustainable economic and urban development.  Given the statistics of the United Nations (UN), the global urban population increased from 750 million in 1950 to 4.2 billion in 2018, which was a more than 550 percent increase in nearly seven decades. The 4.2 billion urban populations accounted for 55 percent of the total global population. Such a rapidly rising trend is expected to continue up to nearly 70 percent of the global total population by 2050. The rapid urban migration can cause severe problems in various areas such as traffic, housing, education, labor market, environment etc. In order to tackle on these problems, a multitude of global projects across the USA, the EU, Asia Pacific, and Middle East regions was initiated by the concept of smart cities last decade.  There is no single or standardized definition to the concept of a smart city that is still in flux and subject to debate. As such, definitions of smart cities vary across OECD member countries and institutions according to the geopolitical context and to the specific issues. However, the central theme of a smart city applies to information and digital technologies to provide intelligent and innovative solutions for an urban ecosystem such as infrastructure, transport, healthcare, governance, security etc. which play core roles in the digital economy. Under such rapidly changing circumstances, the lectures focus on whether or not the concept of the smart city can be realized in the Fourth Industrial Revolution era and how it can be realized in the digital economy. |
| **Reading list** | 1. Ahmad, K., Maabreh, M., Ghaly, M., Kahn, K., Qadir, J., and Al-Fuqaha, A. (2021) Developing Future Human-Centered Smart Cities: Critical Analysis of Smart City Security, Data Management, and Ethical Challenges 2. Allied Market Research (2018) Global Opportunity Analysis and Industry Forecast, 2018-2025 3. Anthopoulos, L.G. (2015) Understanding the Smart City Domain: A Literature Review, in Bolivar, R. and Pedro, M. (eds.) Transforming City Governments for Successful Smart Cities, London: Springer International Publishing 4. Bajarin, T. (2020) Smartphones’ Role in Changing World History, Forbes, June 09. 5. Bonilla-Molina, L. (2020) COVID-19 on Route of the Fourth Industrial Revolution, Postdigital Science and Education, Vol. 2, pp. 562-568 6. Bouton, S., Cis, D., Mendonca, L., Pohl, H., Remes, J., Ritchie, H., and Woetzel, J. (2013) How to Make a City Great? New York: McKinsey & Company 7. Castro-Jul, F., Díaz-Redondo, R. P., and Fernández-Vilas, A. (2018) Collaboratively Assessing Urban Alerts in Ad Hoc Participatory Sensing. Computer Networks, Vol. 131, pp. 129–143 8. De Castro SobrosaNeto, R., Sobrosa Maia, J., de Silva Neiva, S., Dillion Scalia, M. and de Andrade Guerra, J. B. S. O. (2020) The Fourth Industrial Revolution and the Coronavirus: A New Era Catalyzed by a Virus, Research in Globalization, Vol. 2, pp. 1-15 9. Dicken, P. (2015) Global Shift: Mapping the Changing Contours of the World Economy, New York/London: The Guilford Press 10. Florida, R., Mellander, C., and King, K. (2015) The Global Creativity Index 2015, Toronto: Martin Prosperity Institute 11. Gomez, C., Chessa, S., Fleury, A., Roussors, G., and Preveneers, D. (2019) Internet of Things for Enabling Smart Environments: A Technology Centric Perspective, Journal of Ambient Intelligence and Smart Environments, Vol. 11, No. 1, pp. 23-43 12. Green, B. (2019) The Smart Enough City: Putting Technology in Its Place to Reclaim Our Urban Future, Boston: MIT Press 13. Lin, H. W., Nagalingam, S. V., Kuik, S. S. and Murata, T. (2012) Design of a Global Decision Support System for a Manufacturing SME: Towards Participating in Collaborative Manufacturing, International Journal of ProductionEconomics, Vol. 136, No. 1, pp. 1–12 14. Lom, M., Pribyl, O. and Svitek, M. (2016) Industry 4.0 As a Part of Smart Cities, Smart City Symposium Prague 2016 15. Park, S. C. (2018) The Fourth Industrial Revolution and Implications for Innovative Cluster Policies, AI & Society, Vol. 33, No. 3, pp. 433-445 16. Rüssmann M, Lorenz M, Gerbert P, Waldner M, Justus J, Engel P, Harnisch, M (2015) Industry 4.0: the future of productivity and growth in manufacturing industries. The Boston Consulting Group Inc, Boston 17. United Nations, Department of Economic and Social Affairs, Population Division (2019) World Urbanization Prospects: The 2018 Revision, New York: UN |
| **Educational outcomes** | KNOWLEDGE   1. Technology transform in the industrial revolutions 2. Impacts of high technology on the global economy 3. Changing structures of the global economy toward digital economy   SKILLS   1. English capacity 2. Basic knowledge of social sciences in politics, economy, sociology etc.   ATTITUDES   1. Readiness to learn 2. Goal oriented 3. Responsibility and sincerity |
| **Practice** | n/a |

INFORMATION ABOUT CLASSES IN THE CYCLE

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| **Website** | <https://www.umcs.pl/en/courses-in-english,21103.htm>  (dla PJOE) |
| **Educational outcomes verification methods** | Lecture and presentation, discussion, Q & As |
| **Comments** | - |
| **Reading list** | 1. Background of the Fourth Industrial Revolution 2. Evolution of the Fourth Industrial Revolution 3. Characters of the Fourth Industrial Revolution 4. Concept of the digital economy 5. Roles of the digital economy in the Fourth Industrial Revolution era 6. Structure of the digital economy 7. Smart Phones, smart homes, smart factories 8. Smart Cities 9. Smart Cities as a new industrial sector 10. Global trend of smart cities 11. Advantages of smart cities 12. Disadvantages of smart cities 13. Smart cities in the digital economy 14. Future of human beings’ way of life in the digital economy |
| **Educational outcomes** | KNOWLEDGE   1. Technology transform in the industrial revolutions 2. Impacts of high technology on the global economy 3. Changing structures of the global economy toward digital economy   SKILLS   1. English capacity 2. Basic knowledge of social sciences in politics, economy, sociology etc.   ATTITUDES   1. Readiness to learn 2. Goal oriented 3. Responsibility and sincerity |
| **A list of topics** | 1. Background of global trade 2. Macro environment of global trade 3. WTO and multilateralism 4. Multilateralism versus bilateralism 5. Emerging Mega FTAs 6. Trade conflict and protectionism 7. Trade conflict between the USA and China 8. End of globalization and renewing regionalization? 9. Trade war and technology hegemony 10. Pandemic and outbreak of global supply chains 11. Trade war and reshaping global supply and value chains 12. East Asia’s role in reshaping global supply and value chains 13. Strategic technologies in the new global supply and value chains |
| **Teaching methods** | Lectures with power points, discussion, Q & As, home works, teamwork etc. |
| **Assessment methods** | The course will be evaluated by two examinations. One is the midterm examination, and the other is the final examination. Additionally students need to submit short reports based on individual tasks which must be maximum three pages with A4 size of word format. Moreover, students and instructor can communicate with one another by internet and email closely in order to share their views and opinions that can generate new ideas and solution measures how to apply their knowledge for their future and Asian economic integration.  The credit will be given by A+ (100 ~ 95 points), A (90 ~ 94 points), B+ (85 ~ 89 points), B (80 ~ 84 points), C+ (75 ~ 79 points), C (70 ~ 74 points), D+ (65 ~ 69 points), D (60 ~ 64 points), and F (less than 59: failed). |