

Foundations of Educational Technology

Credit: 3-0-0

Course Description

The present course focuses on the conceptual framework of technology, theories, and practices in educational environments. Students are provided the opportunity to analyze theories related to educational technology, and apply twenty-first century skills with technology. The main goal of this course is to prepare students to design, create, implement and evaluate technology-supported solutions for business, industry, non-profit and government organizations.

Course Objectives

Upon completion of the course the students will be able to

- Incorporate learning theories with emerging technologies
- Acquire awareness and understanding of emerging technologies
- Integrate the practical applications of technology to enhance the 21st century skills
- Interpret design principles and relate them to technology-enhanced learning
- Apply educational technology in educational and corporate sectors

Course Content

- 1. Module 1: Introduction to educational technology (5)**
 - Defining educational technology
 - Ethics and educational Technology
- 2. Module 2: Relating learning theories to practices (12)**
 - Cognitive load theory
 - Cognitive theory of multimedia learning
 - Social learning theory
 - Information processing theory
 - Dual coding theory
 - Connectionism
 - Situated learning theory
- 3. Module 3: Emerging technologies with example applications (10)**
 - Introducing innovative and emerging technologies (Augmented reality, Virtual reality, Mixed reality, Educational Robots, Games and simulations, Mobile learning)
 - Conceptual framework for emerging technologies
 - Designing technology-supported learning environments
- 4. Module 4: Educational technology in the workplace (8)**
 - Understanding workplace learning as a complex dynamic System
 - Benefits of educational technology in the workplace
 - Educational technology in healthcare sector

- Educational technology for continuing education and professional development
- Educational technology in corporate sector
- Incorporation of educational technology in knowledge management

5. Module 5: Issues and Challenges in Educational Technology (5)

- Digital divide
- Gender and Information technology
- Barriers to technology integration

Books

1. Spector, J. M., Merrill, M. D., Elen, J., & Bishop, M. J. (Eds.) (2014). *Handbook of research on educational communications and technology* (4th ed.). New York: Springer.
2. Spector, J. Michael. (2012). *Foundations of Educational Technology: Integrative Approaches and Interdisciplinary Perspectives*. New York: Routledge.
3. Liu, D., Dede, C., Huang, R., & Richards, J. (Eds) (2018). *Virtual, Augmented, and Mixed Realities in Education*. Singapore: Springer Singapore.

References

1. Johnson, L., Adams Becker, S., Cummins, M., Estrada, V., Freeman, A., and Hall, C. (2016). *NMC Horizon Report: 2016 Higher Education Edition*. Austin, Texas: The New Media Consortium.
2. Bhagat, K. K., Liou, W. K., Spector, J. M. & Chang, C.-Y. (2018). To Use Augmented Reality or not in Formative Assessment: A Comparative Study. *Interactive Learning Environments*. DOI: 10.1080/10494820.2018.1489857
3. Bhagat, K. K., Liou, W. K., & Chang, C.-Y. (2016). A Cost-Effective Interactive 3D Virtual Reality System Applied to Military Live Firing Training. *Virtual Reality*, 20(2), 127-140.
4. Liou, W. K., Bhagat, K. K., & Chang, C.-Y. (2018). The Design, Implementation, and Evaluation of a Digital Interactive Globe System Integrated into an Earth Science Course. *Educational technology research and development*. 66(2), 545-561. doi.org/10.1007/s11423-018-9573-2
5. Bhagat, K. K., & Spector, J. M. (2017). Formative Assessment in Complex Problem-Solving Domains: The Emerging Role of Assessment Technologies. *Educational Technology & Society*, 20(4), 312-317.
6. Liou, W. K., Bhagat, K. K., & Chang, C.-Y. (2016). Beyond the flipped classroom: A Highly Interactive Cloud-classroom (HIC) embedded into basic materials science courses. *Journal of Science Education and Technology*, 25(3), 460–473.