

Course Number : HS 528
Course Name : **Information Technology and Development**
Credits : 3-0-0-3
Prerequisites : None
Intended for : Post-graduate students; 3rd and 4th Year B. Tech. students

Distribution : Core course for M.A. in Development Studies, Elective for others
Semester : Even/Odd

1. Preamble:

This course focuses on how contemporary information and communication technologies (e.g., the Internet and mobile phones) are being used to fuel development in countries like India. The course discusses how technology helps the development of healthcare, education, good governance, environmental sustainability, and disaster management. Also, it discusses the pitfalls of technology and its applications. This course intends to provide students an in-depth view on how technology can play a positive role in promoting development.

2. Course Modules::

Module 1: Introduction to technology and development (8 hours)

Definitions of technology, Systemic views of Technology-Society relationships, Development paradigms, Social and commercial mechanisms for linking technology to developmental needs; (Certain example cases could include: a case study on same language subtitling (SLS) for improving reading ability in India; a case study on hole-in-the-wall project in India, Bhutan, Cambodia, and Africa and how it encourages children to learn via entertainment; self-organized learning and mediated environments in India and Oscar-winning movie Slumdog Millionaire; failure of little intelligent community based ICT in Central America.)

Module 2: Overview of ICT for development (12 hours)

Development agenda and positioning of ICT for development; information and knowledge society; technological interests and social change; real-world applications of ICT in development; the role of technology in reducing poverty (e.g., computer aided learning and Mille.org); the role of ICT in overcoming healthcare challenges (e.g., telemedicine, information gathering, and low-cost point of care testing medical devices- translating health care from bench to bedside); the role of technology in causing agricultural innovation (e.g., telecentres and digital Green like the green-

wifi.org and the e-sagu project); role of ICT in surveillance and good governance, communications, infrastructure, and user-interface design.

Module 3: Participatory methods in technology and development (5 hours)

Discussion on participatory methods (e.g., documentary “Water of Ayolé” (Sandra Nichols)); different principles and modes of participation; contributors to ICT projects failures; role and issues in community-based participatory research (e.g., case of the African Digital Renaissance).

Module 4: Networking, access, mobile technologies, and development (5 hours)

Access to hardware, software, information and services; LTE and Internet backbone; role of TCP/IP and other protocols; (Certain example cases could include the case of the last 10km in Rwanda; case of microwave in rural Alaska; role of cellular – voice and data; case of M-PESA in India and Kenya.)

Module 5: Cyber-security and development (3 hours)

Intrusion-detection systems; deception; block chain technology; Cloud access security brokers (CASB); Endpoint detection and response (EDR); Non-signature approaches for endpoint prevention; Remote browser.

Module 6: User interface design, cloud computing, HCI and development (4 hours)

Role of cloud computing in promoting development; configuring Wikispaces and a website; role of HCI in development since its emergence in 1980s; symbiotic relationship between humans and computers (example, the case of spoken web: using voice as an accessibility tool for disadvantaged people in developing countries); grand challenges in HCI for development.

Module 7: New devices, sensor networks in development (5 hours)

Role of sensor and IoT revolution and how it aids development (examples of IoT for farming and natural disasters); notion of wearable computing devices and its impact on sustainable development; wireless sensor networks and their role in development; influence of IoT on different policy areas.

3. Textbooks:

Heeks, R. (2017). *Information and Communication Technology for Development (ICT4D)*. Routledge, London, UK.

Seth, K. (2016). *Computers, Internet And New Technology Laws-A Comprehensive Reference Work With Special Focus On Developments In India*. Lexis Nexis

4. References:

Barrat, J. (2013). *Our final invention: Artificial intelligence and the end of the human era*. Macmillan.

- Cooper, C. (2017). *Technology and development in the Third industrial revolution*. Routledge.
- Cornwall, A., & Jewkes, R. (1995). What is participatory research?. *Social science & medicine*, 41(12), 1667-1676.
- Dodson, L. L., Sterling, S., & Bennett, J. K. (2012, March). Considering failure: eight years of ITID research. In *Proceedings of the fifth international conference on information and communication technologies and development* (pp. 56-64). ACM.
- Garrity, J. (2015). Harnessing the Internet of Things for Global Development. *SSRN Electronic Journal*. doi:10.2139/ssrn.2588129.
- Ho, M. R., Smyth, T. N., Kam, M., & Dearden, A. (2009). Human-computer interaction for development: The past, present, and future. *Information Technologies & International Development*, 5(4), pp-1.
- Kendall, J., & Voorhies, R. (2014). The mobile-finance revolution: How cell phones can spur development. *Foreign Affairs*, 93(2), 9-13.
- Kumar, A., & Agarwal, S. K. (2012). Spoken web: using voice as an accessibility tool for disadvantaged people in developing regions. *ACM SIGACCESS Accessibility and Computing*, (104), 3-11.
- Mandal, G. C. (2010). *Social Impact of Banking, Technology and Development In Village India*. Rajat Publications.
- Mas, I., & Radcliffe, D. (2010). Mobile payments go viral: M-PESA in Kenya. *The Capco Institute Journal of Financial Transformation*, 169-182.
- Padma, S. R., Rathakrishnan, T., & Thomas, M. (2012). *Participatory Technology Development: A Technique for Indigenous Technical Knowledge Refinement*. Scientific Publisher.
- Pannu, P., & Tomar, Y. A. (2012). *Communication Technology for Development*. I K International Publishing House Pvt. Ltd.
- Raina, R. S. (2015). *Science, Technology and Development in India: Encountering Values*. Orient Longman.
- Sankar, S. (2012). The rise of human-computer cooperation. In *TED Talk Lesson, TED Conferences, junho de*.
- Smith, M. L., Spence, R., & Rashid, A. T. (2011). Mobile phones and expanding human capabilities. *Information Technologies & International Development*, 7(3), pp-77.
- Toyama, K. (2011). On turbocharged, heat-seeking, robotic fishing poles. *Communications of the ACM*, 54(12), 29-31.

Unwin, T. (2008). *ICT4D: Information and Communication Technologies for Development*. Cambridge University Press, Cambridge.

5. Similarity Content Declaration with Existing Courses: None

**6. Justification for new course proposal if cumulative similarity content is > 30%:
NA**