



Birla Institute of Technology & Science, Pilani
Hyderabad Campus

SECOND SEMESTER 2019-2020

Course Handout Part II

Date: 02-01-2020

In addition to part-I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course No. : CS F441
Course Title : **Special Topics from Computer Science: Introduction to Information and Communication Technologies and Development**
Instructor : Dipanjan Chakraborty

Scope and Objective of the Course:

This is an advanced level course for senior undergraduate students and masters students. As the leaders of tomorrow, our students ought to understand the societal challenges facing the world, how are policy-makers planning to tackle them, how have social scientists tackled the problems, where and how the skills of our students can be applied to impact such problems, and the limitations of applying engineering skills to solve real-world problems. In order to do this, in this course we will study different tech-centric interventions that technologists have designed to solve social problems, cutting across technologies and application domains. Technologists have also realised that there are many other factors which need to be in place in order for technology to make any impact. We will study several of these factors in this course, distilling a list of best practices for technologies to make social impact. We will also study several theories of development and how researchers have applied these theories to technology design. We also study evaluation methods developed to measure the success of ICTD interventions.

- This course will introduce students to understanding the societal challenges of the world and if and how Information and Communication Technologies can tackle them. After the successfully completing the course, the students will:
 - learn about the different application areas (SDGs, MDGs, etc.) where Information and Communication Technologies can play a catalytic role
 - learn to appreciate that technology is not a silver bullet, there are several other factors that need to be in place to create an environment in which technology can succeed
 - learn that an impactful technology does not need to be complex, the simplest of technologies can have big impact
 - learn to appreciate diversity among technology users, learn to put users at the centre of any technology, learn to conduct effective user-studies
 - learn about the pitfalls of tech-determinism

Textbooks:

1. Toyama. Geek Heresy
2. Reading materials and research papers to be circulated



Reference books

1. Sen and Dreze. An Uncertain Glory: India and Its Contradictions.
2. Piketty. Capital in the 21st Century
3. Sen. Development as Freedom
4. Sense And Solidarity - Jholawala Economics for Everyone
5. Smillie, I. Mastering the machine.
6. Habermas, J. Structural Transformation of the Public Sphere.
7. Tim Unwin (ed). ICT4D: Information and Communication Technology for Development
8. Tim Unwin. Reclaiming Information and Communication Technologies for Development
9. Alan Bryman. Social Research Methods

Course Plan:

Lecture No	Learning Outcomes	Topic(s)	Chapters/Reading Materials
1-2	To motivate the students for the course	Need for social development: motivating the topic using economic indicators and other factors	1. Amartya Sen. Development As Freedom: An India Perspective 2. R3: Introduction 3. R2: Part III 4. R1: ch. 2, 8
3-4		Models of social development	5. Extra Reading Materials
5-6		Examples of social development initiatives from India and around the world	6. R4: ch. 4-7
7-8		How can ICTs help in social development	7. Eric Brewer, Michael Demmer, Bowei Du, Melissa Ho, Matthew Kam, Sergiu Nedeveschi, Joyojeet Pal, Rabin Patra, Sonesh Surana. The Case for Technology in Developing Regions
9-11	To acquaint students with some case studies on Tech-centric ICTD interventions	Tech-centric ICTD interventions: successes and failures	8. T1: ch 1-4



12-13	To acquaint students with the research on low cost and last mile connectivity for rural areas	Communication systems: TV White space	9. Adriana B. Flores, Ryan E. Guerra, and Edward W. Knightly, Peter Ecclesine and Santosh Pandey. IEEE 802.11af: A Standard for TV White Space Spectrum Sharing
14-15		Communication systems: Rural Internet Access	10. Talal Ahmad, Yasir Zaki, Thomas Pötsh, Jay Chen, Arjuna Sathiaselalan, Lakshminarayanan Subramanian. GAIUS: a new mobile content creation and diffusion ecosystem for emerging regions 11. Bhaskaran Raman and Kameswari Chebrolu. Experiences in Using WiFi for Rural Internet in India 12. Spencer Sevilla, Matthew Johnson, Pat Kosakanchit, Jenny Liang, Kurtis Heimerl. Experiences: Design, Implementation, and Deployment of CoLTE, a Community LTE Solution
16-17		Communication systems: non-Internet systems (IVR, mechanical backhaul)	13. Sheetal K. Agarwal, Anupam Jain, Arun Kumar, Amit A. Nanavati, Nitendra Rajput. The spoken web: a web for the underprivileged 14. A. Seth, D. Kroeker, M. Zaharia, S. Guo, S. Keshav. Low-cost communication for rural internet kiosks using mechanical backhaul
18-19	To acquaint students with some HCI interventions for Development	HCI4D: IVR	15. Zahir Koradia, Piyush Aggarwal, Gaurav Luthra, Aaditeshwar Seth. Gurgaon idol: a singing competition over community radio and IVRS 16. Neil Patel, Sheetal Agarwal, Nitendra Rajput, Amit Nanavati, Paresh Dave, Tapan S. Parikh. A Comparative Study of Speech and Dialed Input Voice Interfaces in Rural India
20-21		HCI4D: Smartphones	17. Samia Ibtasam, Hamid Mehmood, Lubna Razaq, Jennifer Webster, Sarah Yu, Richard Anderson. An Exploration of Smartphone Based Mobile Money Applications in Pakistan
22-23		HCI4D: kiosks	18. S. Guo, M. H. Falaki, E. A. Oliver, S. Ur Rahman, A. Seth, M. A. Zaharia, S. Keshav.



			Very low-cost internet access using KioskNet
24-25		HCI4D: offline systems	<p>19. Kiran Gaikwad, Gaurav Paruthi, and William Thies. Interactive DVDs as a Platform for Education</p> <p>20. Gaurav Paruthi, William Thies. Utilizing DVD Players as Low-Cost Offline Internet Browsers</p> <p>21. Andrew Cross, Edward Cutrell, and William Thies. Low-cost Audience Polling Using Computer Vision</p> <p>22. Rikin Gandhi, Rajesh Veeraraghavan, Kentaro Toyama, Vanaja Ramprasad. Digital Green: Participatory Video for Agricultural Extension</p>
26-27	To acquaint students with interventions on community media and bottom-up information platforms	Bottom-up information access: helplines, IVRs, voicebots, social media	<p>23. Dipanjan Chakraborty, Mohd Sultan Ahmad, Aaditeshwar Seth. Findings from a Civil Society Mediated and Technology Assisted Grievance Redressal Model in Rural India</p> <p>24. Meghana Marathe, Jacki O'Neill, Paromita Pain, and William Thies. Revisiting CGNet Swara and its Impact in Rural India</p> <p>25. Neil Patel, Deepti Chittamuru, Anupam Jain, Paresh Dave, Tapan S. Parikh. Avaaj Otalo — A Field Study of an Interactive Voice Forum for Small Farmers in Rural India</p>
28-30	To acquaint students with work done using data science techniques for social good	Top-down information dissemination: satellite data and aerial imagery, mass media (Data for Development, AI for Social Good)	<p>26. Dave Donaldson and Adam Storeygard. The View from Above: Applications of Satellite Data in Economics</p> <p>27. Michael Xie, Neal Jean, Marshall Burke, David Lobell, Stefano Ermon. Transfer Learning from Deep Features for Remote Sensing and Poverty Mapping</p>
31-33	To acquaint students with different ICTD theories developed over time	Theories on development and ICTs	<p>28. Dorothea Kleine. ICT4What? – Using the Choice Framework to operationalise the Capability Approach to Development</p> <p>29. Gary Marsden, Andrew Maunder and Munier Parker. People are people, but technology is not technology</p> <p>30. T1: ch 2, 6</p>
34-36	To acquaint students with different ICTD design and evaluation methodologies	Design and Evaluation Methodologies in ICTD	<p>31. Susan Wyche. Exploring Mobile Phone and Social Media Use in a Nairobi Slum: A Case for Alternative Approaches to Design in</p>



	developed over time		<p>ICTD</p> <p>32. Padma Chirumamilla Joyojeet Pal. Play and Power: a Ludic Design Proposal for ICTD</p> <p>33. Eric Brewer, Michael Demmer, Melissa Ho, R.J. Honicky, Joyojeet Pal, Madelaine Plauché, and Sonesh Surana. The Challenges of Technology Research for Developing Regions</p> <p>34. Matt Haikin & Richard Duncombe. A Framework to Assess Participation and Empowerment Impacts of ICT4D Projects</p>
37-42	To help students learn by listening to their peers	Peer-learning: project idea development and presentation, project progress, final presentation	These sessions will be interleaved with the lectures in consultation with the students

Old Evaluation Scheme:

Component	Duration	Weightage (%)	Date & Time	Nature of Component
Comprehensive examination	3 hours	30%	8 th May, 2020, afternoon	Written, closed book
Mid-term examination	1.5 hours	20%	-	Written, closed book
Project	Rolling	30%	-	-
In-class Assignments	Rolling	10%	unannounced	In-class, open material
Paper Presentations	Rolling	10%	-	-

New Evaluation Scheme:

Component	Duration	Weightage (%)	Date & Time	Nature of Component
Comprehensive examination	3 hours	40%	8 th May, 2020, afternoon	Written, closed book
Mid-term examination	1.5 hours	20%	-	Written, closed book
Project	Rolling	20%	-	-
In-class Assignments	Rolling	5%	unannounced	In-class, open material
Paper Presentations	Rolling	15%	-	-



Chamber Consultation Hour: TBA

Notices: To be circulated through CMS

Old Evaluation and Make-up Policy:

- **In-class Assignments.** All unattempted in-class assignments will be counted with a zero score. Ceiling of top 70% scores for in-class assignments (including unattempted in-class assignments) will be counted. For example, if a student scores the following in 10 in-class assignments: [UA, 10, 4, 7, UA, UA, 9, 0, 8, UA], the scores which will be counted are: [UA, UA, UA, UA, 10, 9, 8].
- Make up for **mid-term and comprehensive examinations** will be allowed only in extreme situations and institute rules will apply. However, *prior permission* from the IC is compulsory.

New Evaluation and Make-up Policy:

- **In-class Assignments.** In-class Assignments will only be given when the institute is open as not all students have the bandwidth to participate live during the online classes. For evaluations, we will consider n-1 in-class assignments from when the institute is/was open.
- Make up for **mid-term and comprehensive examinations** will be allowed only in extreme situations and institute rules will apply. However, *prior permission* from the IC is compulsory.

NC Policy

Only writing the mid semester and comprehensive examination is not sufficient to clear this course. If an honest attempt is not made to learn in the course by attempting the assignments and the other components, an NC grade will summarily be awarded.

Academic Honesty and Integrity Policy:

The highest level of academic honesty and sincerity is expected in the course. It is OK to make mistakes and learn honestly. Any attempts at gaming the system or colluding with other students (or groups of students for group activities) will attract a zero score for that component and also a grade penalty. Repeat offenders will be reported for disciplinary proceedings. For a good reference on cheating vs. collaboration see <http://www.cse.iitd.ac.in/~mausam/courses/col772/spring2019/>

INSTRUCTOR-IN-CHARGE

