

ADE/B.Ed. (Hons) Elementary

Syllabus

**Information and Communication
Technologies (ICTs) in Education**

Semester 3

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Technical Support: Education Development Centre (EDC); Teachers College, Columbia University

Syllabus: Information and Communication Technologies (ICTs) in Education

YEAR/SEMESTER: Year 2, Semester 3

DURATION: 2 credits (32 facilitated hours, 64 essential independent study and practice hours)

PREREQUISITES: Successful completion of Semester 1 and 2 courses including Computer Literacy in Semester 2

COURSE DESCRIPTION

Information and Communication Technologies (ICTs) in Education is a broad and constantly changing subject. This course will prepare teachers to understand, use and apply a range of technologies* and platforms in teaching and learning, in line with international standards.

With the changing face of technologies and related application, this course will primarily focus on using technologies for learning 'how to learn' to cope with change. It will provide opportunities to prospective teachers to collaborate with students, educators, peers, parents, and global community using digital tools and resources to support learning, success and innovation.

Course topics include supporting policies and guidelines for ICTs integration, computer-mediated learning, telecommunications and multimedia resources, online teaching and learning, problems of classroom integration, and computer support for professional development and administration.

Teachers-in-training will engage with the design and creation of exciting, intellectually challenging and authentic learning environments in which ICT changes not only what students learn but also how they learn, as we move forward in the 21st century. Trainees in this course will examine how ICT might be used to both enhance and transform learning.

The changing world demands changes in, and quickly learning competencies. The course is aimed at specifically developing the following competencies in prospective teachers:

- critical thinking and reflective approach,
- decision-making,
- handling of dynamic situations,
- multi-tasking
- working as a member of a team, and collaboratively
- communicating effectively, and
- general ICT competencies enabling professional and day-to-day work

*(computer/Internet, other audio/video equipment, digital camera, mobile phones, online and digital resources and tools)

The ADE/B.Ed. (Honours) program aims to develop in its graduates the capabilities and dispositions to work as engaged professional educators in contemporary knowledge building communities. Use of ICTs in all courses across the program is highly appreciated to achieve this end. Focusing on the details of ICTs integration in education would be challenging for this 2-credit hour course. Therefore, course-extension suggestions and ideas are also provided at the end of this course guide.

The course comprises (a) an experience-based study of learning with information and communications technologies (ICTs), (b) a critical examination of pedagogical, technical, and

societal issues arising in the educational use of ICT, and (c) the development and evaluation of educational applications and resources of ICTs.

COURSE OUTCOMES

After completing this course, pre-service teachers/teachers will be able to:

1. develop a well-articulated perspective on information and communications technology in education informed by personal experience and critical examination of computer resources, curriculum, and educational practice.
2. model and facilitate effective use of current and emerging digital tools to locate, analyze, evaluate, and use information resources to support research and learning
3. engage students in exploring real-world issues and solving authentic problems using digital tools and resources
4. participate in local and global learning communities to explore creative applications of technology to improve student learning
5. promote student reflection using collaborative tools to reveal and clarify students' understanding and thinking, planning and creative processes
6. evaluate and reflect on current research and professional practice on a regular basis to make effective use of existing and emerging digital tools and resources in support of student learning
7. develop confidence, skill and an attitude to use a range of technologies (radio, video, computer, digital and online tools, digital accessories, etc.) for instruction and generating new knowledge for life-long learning

LEARNING AND TEACHING APPROACHES

Teachers-in-training and instructors should integrate this course with other courses and with their theses or projects; adapt the course to personal interest, knowledge, experience, and responsibility; and design assignments with sufficient depth and breadth to be useful in other courses and later work.

Trainees will combine the exploration of educational software and other ICT resources with the discussion of its application with a critical examination of educational issues that surface with computer and other ICTs use - issues such as empowerment, the shaping of modes of thinking, access, control, ownership, role of student and teacher, classroom and school organization, and professional development.

Throughout the course, electronic mail (email), Google applications, and other tools that support collaboration will be used to provide continuity of discourse, to increase the coherence of work, to share information, to discuss issues, and to articulate thoughts about ICTs in education.

The course facilitators will model the use of ICTs to support professional interaction and learning. The prospective teachers need to be “immersed” in a technology-rich instruction experience and practice so as to progress on various levels of ICT integration in education.

Peer-teaching or peer-instruction would be used regularly as a learning strategy as the participants of this course specifically, are expected to benefit from it much more than lecturing or other strategies when it comes to using technologies. Other active-learning strategies such as discussions, pair and group work, etc. are suggested to be used rigorously throughout the course. The sessions are designed in a way that they use content to teach skills. The instructors would observe that the first half of most of the sessions in Unit-2 is about using content from different subjects. The second half focuses on analysis of how use of technology enhanced and/or

supported teaching of skills by using particular content. It should be noted that none of these halves or session sections should be treated as ‘optional’.

Who should teach this course?

The Methods of Teaching instructor is recommended to take this course, however, team-teaching is highly recommended. As the course teaches skills using content from different subjects, team-teaching is expected to have a multiplier effect to enhance learner achievement. Instructors’ collaboration is also expected to set an example for the trainees to collaborate. The instructors are encouraged to co-plan the sessions and use a variety of team-teaching techniques. Some possible options are where:

- two or more teachers teach the same group at the same time;
- team members meet to share ideas and resources but generally function independently;
- teams of teachers share a common resource centre;
- a team shares a common group of students, shares planning for instruction but team members teach different sub-groups within the whole group;
- planning is shared, but teachers each teach their own specialism or their own skills area to the whole group;
- teams plan and develop teaching resource materials for a large group of students but may or may not teach them in a classroom situation.

A commonly observed misconception is that a computer science expert or a computer literacy instructor should teach such ICT-integration courses.

However, at a teacher-education level where the purpose is to integrate available ICT resources and tools, and to develop local content to be used in classrooms, any subject-expert or a methods teacher is the best person to implement this course. The computer teacher is expected to support the ‘technical’ and operational issues (like working with a multimedia projector, copying files on computer from a digital device, etc.) but s/he wouldn’t be a better judge than a Child Development instructor to assess the ‘value-addition’ that the use of a video-resource brought to the understanding of the subject topic (for example, learning disabilities in children). The bottom-line is ‘it is about education’ and NOT ‘technology’!

Note: It is essential that this course is taught in a computer-lab with broadband Internet connectivity. As this course is heavily-dependent on ‘functioning ICTs’ for using video and other resources, head phones and other audio-video and projection equipment need to be available and functioning ALL the time.

The trainee-practice and study time needs to be organized in the computer lab or computer-equipped classrooms or other such facilities with Internet connection.

SEMESTER OUTLINE	
Unit-1: Introduction to ICTs, Policy and Other Guidelines for Use of ICTs in Education (1 week / 2 hours)	
<p>Unit Overview The first unit aims at providing prospective teachers an understanding of ICTs in Education and the driving forces - i.e., supporting policies and the need. The trainees will get an overview of National Education Policy for Pakistan and the National Professional Standards (NTSTP) for ICTs in Education. The trainees would discuss and analyze the objectives for integrating ICTs in Education to live, learn and work successfully.</p> <p>Intended Learning Outcomes: After going through this unit and the suggested assignments, the trainees would</p> <ul style="list-style-type: none"> • develop an initial understanding of different types and formats of technologies that can be used in education • discuss and analyze the way needed teaching and work skills keep changing with the demand of the day • compare and contrast the conventional teaching practices with technology-supplemented and enhanced instructional and learning opportunities 	
<p>Week 1: (2 sessions/2 hours)</p>	<p>Introduction and Guidelines</p> <ol style="list-style-type: none"> a. Introduction to the course – ICTs in Education b. Pre-assessment for the course c. 21st Century Skills – the need of the day d. What are ICTs? e. Highlights - National ICTs Strategy for Education in Pakistan, National Education Policy 2009
<p>Week 2: (2 sessions/2 hours)</p>	<p>ICTs Integration, Standards and Competencies for Teachers</p> <ol style="list-style-type: none"> a. ICTs Integration – Why and What it means; objectives; misconceptions b. ICT competencies for Teachers c. Highlights - National Professional Standards (NTSTP) for ICTs in Education d. Introduction to electronic Portfolios – setting up for the course
Unit 2: ICTs Integrated into Curriculum and Instruction– (9 weeks / 18 hours)	
<p>Unit Overview This unit provides extensive technology-rich and enhanced instruction experience to the prospective teachers by giving essential knowledge and allocating several hours of practice sessions on ICT applications, discussions and analysis of situations how ICTs are exploited to maximize learning experiences and outcomes. With an understanding of these requirements and benefits of <i>multi-channel learning</i>, the prospective teachers could develop sufficient confidence and skills to design ICT-supplemented instruction, using alternatives as needed.</p>	

Training teachers how to implement technology-enhanced instruction can fail. One of the reasons is that teachers experience "Information Overload" very easily when it comes to technology, and they shut down. This unit breaks the 'tasks' into small "chunks" (sessions by technology) coupled with hands-on practice which is expected to lead to success!

Intended Learning Outcomes:

The trainees will:

- go through technology-rich experiences throughout all aspects of the training and understand ICT's-integration for a variety of content and pedagogical themes
- develop an understanding of providing video-enhanced learning experiences to their students
- practice utilizing technology effectively to enhance teaching through lesson-planning
- analyze, experience and get supported through peer-teaching
- compare and contrast the conventional teaching practices with technology-supplemented and enhanced instructional and learning opportunities
- develop a technology plan for practicum school and classroom after thorough analysis of situation

<p>Week 3: (2 sessions/2 hours)</p>	<p>Learning through custom-designed/ready-made applications (available on DVDs/CDs – Story of Pakistan, tutorials, multimedia encyclopedias, etc.)</p> <ol style="list-style-type: none"> a. Exploring the custom-designed multimedia resources b. Instruction using available applications for teaching of Pakistan Studies/History, Functional English, Methods of Teaching, etc.) c. Lesson planning and review
<p>Week 4: (2 sessions/2 hours)</p>	<p>Audio, Radio Broadcast and Interactive Radio Instruction (IRI)</p> <ol style="list-style-type: none"> a. Power of audio/radio in education b. Using audio/radio/IRI resources for teaching of different subjects (Functional English, Pakistan Studies/Islamic Studies, Early Childhood Education, etc.) c. Case-studies for extended reading
<p>Week 5: (2 sessions/2 hours)</p>	<p>Video, animations, movies and television broadcast (Examples for different content/subject and pedagogy areas - Child Development, Early Childhood Education, Communication, Geography, Science, etc.)</p> <ul style="list-style-type: none"> • Using recorded-classroom videos (Examples for different subject and pedagogy areas - Child Development, Early Childhood Education etc.) • Using video prompts in classroom • Lesson Planning using video resources
<p>Week 6: (2 sessions/2 hours)</p>	<p>(Continued) Video, animations, movies and television broadcast</p> <ul style="list-style-type: none"> • Using movies in education • Using video commercials in education • Using split-video technique in classroom

	<ul style="list-style-type: none"> • Documentaries and discussions • Exploiting the potential of television broadcast in education • Case-studies for extended reading • Lesson Planning using video resources • Lesson Demo and Presentations
Week 7: (2 sessions/2 hours)	<p>Learning through Internet (applications, etc.) (Examples for different content/subject and pedagogy areas – Teaching of Science, language-development, improving communication skills, etc.)</p> <ol style="list-style-type: none"> a. Concept of globalization –‘Global Teacher Community’ b. Online tutorials c. Browsing for a purpose - Seeking and filtering information d. Online tools for communication and collaboration e. Introduction to Digital Libraries, archives and eBooks
Week 8: (2 sessions/2 hours)	<p>Learning through Internet /Videos in Education – Revisited</p> <ol style="list-style-type: none"> a. Interactive Online applications (Google Earth and Google Maps) b. Online video resources and video channels (TeacherTube, YouTube, etc.) c. Sketchcasting technique and animation in education (Case Study: The Khan Academy)
Week 9: (2 sessions/2 hours)	<p>Using Digital Camera in Education (Examples for different content/subject and pedagogy areas - Methods of Teaching, Child Development, Classroom Management, Practicum, etc.)</p> <ol style="list-style-type: none"> a. Power of Pictures/photographs b. Developing local content using digital camera c. ‘Shoot and share’ - Sharing experiences
Week 10: (2 sessions/2 hours)	<p>Interactive Games and Puzzles</p> <ol style="list-style-type: none"> a. <u>Exploring resources and applications</u>, subject-wise (language, Science, Mathematics, etc.) b. <u>Digital Applications - From Toys to Learning Tools</u> <p>Trainees to design a storyboard of an educational game; Or design a puzzle online</p>
Week 11: (2 sessions/2 hours)	<p>Planning for ICTs Integration</p> <ol style="list-style-type: none"> a. <u>Planning for ICTs Integration</u> (SWOT analysis, building support networks, etc.) b. <u>Developing a Technology Plan for Classroom and School</u> c. Barriers for effective ICT use in schools and <u>suggestions</u>

**Unit-3:
Collaborative Learning using ICTs (2 weeks – 4 hours)**

Unit Overview

ICTs has undoubtedly offered numerous practical advantages by allowing users to overcome restrictions of time and place, transcending barriers of textbooks and classroom walls, providing up-to-date resources for teachers and students, supporting a range of individual learning styles, providing authentic contexts for students and broadening the curriculum. One of the most promising ways the Internet is being utilised in schools is to participate in global or collaborative Internet projects and assignments. These projects often involve students in using the Internet and WWW for research, publishing of Web pages and communication using chat and e-mail. These project-based learning contexts are motivating students and providing real life contexts for successful collaborative learning. In this unit, students will experience working on collaborative projects and assignments. It is encouraged that trainees establish contacts with trainees from other institutions in and outside of the country – as, with technology, there are no boundaries to learning!

Week 12:
(2 sessions/2 hours)

Enhancing Opportunities for Collaborative Learning

- a. Collaborative projects (using email, Google Docs/presentations, etc.) – folk tales/cultural stereotypes, learning about communities, and other iEARN projects
 - o Pakistan Studies
 - o English/Urdu – Using email or Google Docs to write a collaborative “Rotating Story” (Project)
 - o Civics, etc.
- b. Using Wikis and Blogs – an introduction

**Unit-4:
ICTs for Life-long Learning and Teacher Professional Development (2 weeks – 4 hours)**

Unit Overview

This unit will provide some orientation to the prospective-teachers and teacher educators about the need for continuous professional development specifically in this age of ever-changing circumstances – technologically, socially, culturally and economically. This unit emphasizes the need of life-long-learning as opposed to learning in the initial part of professional life. Moreover, this unit focuses on supporting life-long-learning with ICTs. The prospective-teachers will learn to connect and ‘connect’ to learn!

Week 13:
(2 sessions/2 hours)

ICTs for life-long learning and teacher professional development

- d. Why life-long learning?
- e. Planning – an information resource (TL resources on WWW, Wikipedia, National curriculum, etc.)
- f. Learning content and methods
- g. ICT/Collaborative Tools for Teachers (Emails, discussion groups, chat, mailing lists, professional forum, etc.)
- h. Teaching-learning and assessment tools (templates, lesson plans, worksheets, online tests-IELTS, etc.)
- i. Video/teleconferencing (Skype)

	j. eLearning and Blended Learning (Introduction)
Week 14: (2 sessions/2 hours)	Continued - ICTs for life-long learning and teacher professional development

Unit-5: Evaluating ICT Tools and Resources for Use (1 week - 2 hours)	
Unit Overview This unit emphasizes the purposeful and judicious selection of digital resources. As a teacher would consider different factors while referencing a book, same is the case with using and referencing any ICT resource, be it a website, a video clip, radio program or an online puzzle. Prospective teachers will evaluate resources based on several factors (purposefulness, need, time, cost, presentation quality, instructional value-addition, usability, context, etc.). Due to time constraints, the types of evaluation for technology interventions in education (like IRI programs, interactive video, etc.) is not covered in this unit (for example, formative and summative evaluation, integrative evaluation, etc.)	
Week 15 (2 sessions/2 hours)	Evaluating ICT tools and resources (1 week - 2 hours) a. Making decisions on identifying ICT resources: Assessing quality and usability of ICT resources with the help of rubrics b. Assessing quality of websites and other Internet applications, educational games, etc. (Gathering and analyzing information)
Week 16 (2 sessions/2 hours)	a. Review b. Post-assessment

Course Extension Ideas	
	<ul style="list-style-type: none"> • Emerging trends (Virtual schools, Online Universities, eTutoring, etc.) • Assistive Technologies (Case Study – Pakistan Foundation for Blinds; Technologies to assist Special Education) • Technologies in other domains of education - Life Skills, health education, vocational training, preparing-for-work, etc.) • Professional Associations online • Digital Libraries • Using Wikis and Blogs • Tools and applications to support distance education (Moodle, Whiteboards, Elluminate, etc.) • Cell phones in education • Concept-mapping (MindMap)

SUGGESTED TEXTBOOKS AND REFERENCES

- *Journal of Research on Technology in Education (JRTE, International Society for Technology in Education (ISTE)* - <http://www.iste.org/learn/publications/journals/jrte-old.aspx>
- *Journal of Technology and Teacher Education (JTATE)* - <http://aace.org/pubs/jtate/>
- Partnership for 21st Century Skills. 2010. *Framework for 21st Century Learning*. http://www.21stcenturyskills.org/index.php?Itemid=120&id=254&option=com_content&task=view

RESOURCES

Geography

- Google Earth free download: <http://www.google.com/earth/download/ge/agree.html>
- Google Earth tutorial: http://earth.google.com/outreach/tutorial_annotate.html
- Google Maps: <http://maps.google.com/>
- National Geographic Channel: <http://maps.google.com/>
- Videos – National Geographic: <http://video.nationalgeographic.com/video/player/national-geographic-channel/>

Science, History, News, etc. - Discovery Channel

- Videos – Discovery Channel
<http://dsc.discovery.com>

Mathematics, Physics, etc.

Videos – The Khan Academy
<http://www.khanacademy.org/>

English:

English Grammar software free download

<http://freesoftwarepc.biz/educational-software/download-free-software-3d-grammar-english-portable/>

GRADING POLICY

A variety of assessments will be used in the course, including mid-term, lesson planning and demonstration, collaborative semester project and final examination.