CURRICULUM OF EDUCATION

B.Ed. (Hons.) Elementary
ADE (Associate Degree in Education)

Course Guide:
GENERAL MATHEMATICS

(Revised 2012)

HIGHER EDUCATION COMMISSION
ISLAMABAD-PAKISTAN

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How this course guide was developed

As part of nation-wide reforms to improve the quality of teacher education, the Higher Education Commission (HEC) with technical assistance from the USAID Teacher Education Project engaged faculty across the nation to develop detailed syllabi and course guides for the four-year B.Ed. (Hons) Elementary and two-year Associate Degree in Education (ADE).

The process of designing the syllabi and course guides began with a curriculum design workshop (one workshop for each subject) with faculty from universities and colleges and officials from provincial teacher education apex institutions. With guidance from national and international subject experts, they reviewed the HEC scheme of studies, organized course content across the semester, developed detailed unit descriptions and prepared the course syllabi. Although the course syllabi are designed primarily for student teachers, they are useful resource for teacher educators too.

In addition, participants in the workshops developed elements of a course guide. The course guide is designed for faculty teaching the B.Ed. (Hons) Elementary and the ADE. It provides suggestions for how to teach the content of each course and identifies potential resource materials. In designing both the syllabi and the course guides, faculty and subject experts were guided by the National Professional Standards for Teachers in Pakistan 2009 and the National Curriculum 2006. The subject experts for each course completed the initial drafts of syllabi and course guides.

Faculty and student teachers started using drafts of syllabi and course guides and they provided their feedback and suggestions for improvement. Final drafts were reviewed and approved by the National Curriculum Review Committee (NCRC).

The following faculty were involved in designing this course guide: Shabana Saeed, GCET (F) Rawalakot; Saima Khan, University of Education, Lahore; Khalid Pervez, GCET Kasur; Dr. Shahid Farooq, IER University of the Punjab, Lahore; Muhammad Zaman, BoC Sindh, Jamshoro; Muhammad Rauf, IER University of Peshawar; Noor Alam, GCET (M) Lalamusa; Shereen Taj, University of Balochistan, Quetta; Zakia Ishaq, GCEE (F) Pishin ; M. Nadeem, RITE (M) DI Khan; Zohra Khatoon, University of Sindh; Shoukat Usmani, GCET (M) Muzaffarabad; Ijaz-Ur-Rauf, GCET Shahpur Sadar, Muhammad Asim, University of Karachi; Rashid Ahmed Noor, RITE (M) Peshawar; Muhammad Rafique, GCET Mirpur; Farjana Memon, GECE (W) Hyderabad; Abdul Khaliq, BoC, Quetta; Muhammad Wasim Uddin, RITE (M) Haripur; Muhammad Afzal, University of Education, Lahore; Gul Muhammad, GCEE Quetta; Shabana Hyder, GECE (W) Hussainabad, Karachi; Dr. Iqbal Majoka, Hazara University; Ibad Ur Rehman, GCET (M) Jamrud; Ghulam Abbass, University of Education, Lahore; Safia Khatoon, GCET(F) Jamrud; Maria Akhtar, Fatima Jinnah Women University, Rawalpindi.

Subject expert guiding course design: Loretta Heuer, Senior Research and Development Associate, Education Development Center (EDC).

Date of NCRC review: 3 March 2012

NCRC Reviewers: Dr. Imran Yousuf, Arid Agriculture University, Rawalpindi; Dr. Tayyab, Foundation University, Islamabad.

Syllabus: General Mathematics

Subject: General Mathematics
Credit value: 3 credit hours
Prerequisite: SSC Mathematics

This course provides opportunities for prospective elementary teachers to strengthen their mathematical knowledge and skills and to gain confidence in their understanding of mathematics. An important outcome of this course is for prospective teachers to be able to teach mathematics successfully in the elementary grades.

Research-based knowledge about good math instruction provides a solid base of information for educators to use as they identify mathematics skills students need to develop, as well as teaching strategies and instructional approaches that best support the development of these skills. The course is designed based on what research tells us about good math instruction.

The overall organization of the course is divided into four units:

1. Number and Operations
2. Algebra and Algebraic Thinking
3. Geometry and Geometric Measurement
4. Information Handling

Each unit of study has a consistent design or organization and is meant to maximize time on learning for prospective teachers.

1. **Content:** Most one hour sessions will begin working on a math problem. Prospective teachers will engage in solving and discussing a math problem and sharing approaches and solutions. The content has been developed to so that prospective teachers will engage in mathematics *in depth* to help them connect concepts within and across the four units.

2. **Pedagogy:** In each lesson prospective teachers will actively engage in doing mathematics in order to experience approaches to teaching and learning math that they can use when they teach. They will recognize that there are often multiple ways of approaching a problem and in some instances more than one correct answer. The instructor will present questions that stimulate curiosity and encourage prospective teachers to investigate further by themselves or with their classmates.

   The course will also examine how children learn and develop mathematical understanding and skills and how the way children think influences the teaching of mathematics in the primary, elementary, and middle grades.

3. **Assignments:** Students are expected to continue learning about math and the teaching of math after class. There will be assignments to stretch prospective teachers content knowledge and to learn more about teaching math. Assignments will take many forms including independently solving math problems and school based tasks.