

English Mediated Instruction (EMI) courses that can fulfill the requirement of the  
PhD program

I. Required Curriculum

Course Code	Course title	Credit	Hour	Level	Half(H)/ Full(F) year
SED0089	Seminar on Science and Society	2	2	PhD	H
SED0090	Seminar on Cognitive perspectives on science learning	2	2	PhD	H
SED0091	Seminar on Curriculum, Instruction and Assessment	2	2	PhD	H
SED0092	Seminar on Digital Learning	2	2	PhD	H
SEC8001	Colloquium (I) (Allow repeated electives)	2	2	M / PhD	H
SEC8002	Colloquium (II) (Allow repeated electives)	2	2	M / PhD	H

II. Elective Curriculum: Courses below are listed in four research areas, “Science and Society,” “Cognition and Science Learning,” “Curriculum, Instruction and Assessment,” and “Digital Learning.” Students should select courses from at least 2 research areas.

(I) Science and Society

Course Code	Course title	Credit	Hour	Level	Half(H)/ Full(F) year
SEC0063	Introduction to the Nature of Science	3	3	M / PhD	H
SEC0068	The Philosophy of Biology	3	3	M / PhD	H
SEC8004	Studies in Science · Technology and Society	3	3	M / PhD	H
SEC8007	Sociology of Knowledge and Science Education	3	3	M / PhD	H
SEC8008	The Philosophy of Science	3	3	M / PhD	H

(II) Cognition and Science Learning

Course Code	Course title	Credit	Hour	Level	Half(H)/ Full(F) year
SED0085	Topics on the Process of Science Learning	3	3	PhD	H
SED0087	Topics on Beliefs about Knowledge and Learning	3	3	PhD	H
SED0080	Topics on Conceptual Change in Science	3	3	PhD	H
SEC0006	Cognitive Psychology and Science Learning	3	3	M / PhD	H

SEC0008	Psychology of Science Learning	3	3	M / PhD	H
SEC0009	Psychology of Mathematics Learning	3	3	M / PhD	H
SEC0011	Studies in Science Problem Solving	3	3	M / PhD	H
SEC0012	Studies in Mathematics Problem Solving	3	3	M / PhD	H
SEC0013	Conceptual Development and Reasoning Ability	3	3	M / PhD	H
SEC0043	Studies in Mathematics Education	3	3	M / PhD	H
SEC0052	Social Constructivism and Science Education	3	3	M / PhD	H
SEC0060	Theories and Practice of Conceptual Change in Science	3	3	M / PhD	H
SEC0066	Topics in Science Learning	3	3	M / PhD	H
SEC0070	Cognitive Models and Modeling	3	3	M / PhD	H
SEC8005	Tracking the Cognitive Processes of Science Learning	3	3	M / PhD	H
SEC8009	Conception and reasoning in science practices	3	3	M / PhD	H

### (III) Curriculum, Instruction and Assessment

Course Code	Course title	Credit	Hour	Level	Half(H)/ Full(F) year
SED0013	Science Curriculum Evaluation	3	3	PhD	H
SED0082	Science Teacher Learning and Preparation	3	3	PhD	H
SEC0022	Development and Design of Science Curriculum	3	3	M / PhD	H
SEC0055	Science Texts Analysis	3	3	M / PhD	H
SEC0074	Evaluation of Science Learning	3	3	M / PhD	H
SEC0075	Evaluation of Mathematics Learning	3	3	M / PhD	H
SEC0077	Studies in Mathematics Curriculum	3	3	M / PhD	H
SEC0078	Theory and Practice of Science Teacher Research	3	3	M / PhD	H
SEC8003	The Language of Science	3	3	M / PhD	H
SEC8006	International Comparative Studies in Science Education	3	3	M / PhD	H
SEC8010	Topics in Science Curriculum and Instruction	3	3	M / PhD	H

### (IV) Digital Learning

Course Code	Course title	Credit	Hour	Level	Half(H)/ Full(F) year
SEC0053	Theory and Research of Learning Technological Tools in Science Education	3	3	M / PhD	H
SEC0054	Design of Technology-infused Science Curriculum	3	3	M / PhD	H
SEC0082	Online Game and Virtual World Learning	3	3	M / PhD	H

### III. Elective Curriculum

#### (I) Research Methodology

Course Code	Course title	Credit	Hour	Level	Half(H)/ Full(F) year
SED0075	Topics in Science Education Research	3	3	PhD	H
SEC0036	Research Methodology of Science Education	3	3	M / PhD	H
SEC0037	Theories of Testing	3	3	M / PhD	H
SEC0038	Qualitative Research	3	3	M / PhD	H
SEC0039	Data Analysis(I)	3	3	M / PhD	H
SEC0040	Data Analysis (II)	3	3	M / PhD	H
SEC0050	Special Topics on Research in Methodology : Methods for Studying Learning Technologies	3	3	M / PhD	H
SEC8011	Introduction to Structural Equation Modeling	3	3	M / PhD	H