SYGN501. RESEARCH SKILLS FOR GRADUATE STUDENTS. 1.0 Semester Hr.
(I, II) This course consists of class sessions and practical exercises. The content of the course is aimed at helping students acquire the skills needed for a career in research. The class sessions cover topics such as the choice of a research topic, making a work plan and executing that plan effectively, what to do when you are stuck, how to write a publication and choose a journal for publication, the ethics of research, the academic career versus a career in industry, time-management, and a variety of other topics. The course is open to students with very different backgrounds; this ensures a rich and diverse intellectual environment. Prerequisite: None. 1 hour lecture; 1 semester hour.

SYGN502. INTRODUCTION TO RESEARCH ETHICS. 1.0 Semester Hr.
A five-week course that introduces students to the various components of responsible research practices. Topics covered move from issues related to the planning of research through the conducting of research to the dissemination of research results. The course culminates with students writing and defending their ethics statements. 1 hour lecture/lab; 1 semester hour.

SYGN503. TOOLS FOR SUCCESS: INTEGRATING INTO THE MINES COMMUNITY. 1.0 Semester Hr.
(I, II) Designed for both incoming and experienced international graduate students who want to strengthen their professional skills for their degree programs and careers. Through engaging materials and conversation, students learn how to more confidently meet expectations, develop an effective professional relationship with their advisor and others on campus, strengthen communication skills, upgrade the quality and efficiency of their writing and presentations, and resolve conflict. Offers a relaxed, friendly space for students to explore questions regarding the cultural and academic transitions they are making and to share strategies for success. 1 hour lecture; 1 semester hour.

SYGN550. INTELLIGENT GEOSYSTEMS. 3.0 Semester Hrs.
Geosystems are natural or engineered earth structures, e.g., earth dam or levee, groundwater system, underground construction site, contaminated aquifer. An intelligent geosystem is one that can sense its environment, diagnose its condition/state, and provide decision support to improve the management, operation or objective of the geosystem. The goal of this course is to offer students background material in this interdisciplinary field. The course will consist of the following five modules: SmartGeo Overview, Sensing, Data Processing, Modeling, and Decision Support. Prerequisite: Graduate standing. 3 hours lecture; 3 semester hours.

SYGN555. SMARTGEO SEMINAR. 1.0 Semester Hr.
Geosystems are natural or engineered earth structures, e.g. earth dams or levees, groundwater systems, underground construction sites, and contaminated aquifers. An intelligent geosystem is one that can sense its environment, diagnose its condition/state, and provide decision support to improve the management, operation, or objective of the geosystem. The goal of this course is to introduce students to topics that are needed for them to be successful working in a multi-disciplinary field. The course will include training in leadership, multidisciplinary teams, policy and ethical issues, and a monthly technical seminar. Prerequisite/Corequisite: SYGN550. 1 hour lecture; 1 semester hour credit.