



**NOTICE OF
UNIVERSITY ORAL**
GEODESY AND GEOMATICS ENGINEERING

Master of Science in Engineering

Maciej Bazanowski

Wednesday, April 14 @ 2:00 pm

Head Hall – Room E-11

**Board of Examiners: Co-Supervisors: Dr. Adam Chrzanowski, GGE
Dr. Anna Szostak-Chrzanowski, GGE
Examining Board: Dr. Peter Dare, GGE
Dr. Arun Valsangkar, Civil Eng.**

Chair: Dr. Sue Nichols

**Integrated Analysis of Long Term Behaviour of Man-made Structures and Rock
Mass in Mining Areas
ABSTRACT**

The author's research was to study and analyse the long term behaviour of structures, based on integration of monitoring data and results of deterministic analysis. The monitoring data representing different types of deformation monitoring surveys (low and high frequency repeated monitoring surveys) have been analysed. For the purpose of deterministic analysis, author created FEM models of investigated structures. The integrated analysis of deformation was performed for two deformation monitoring projects: Diamond Valley Lake project in California, USA, and PCS salt and potash mine in New Brunswick, Canada.

Each structure, whether man-made or natural undergoes deformation when subjected to internal or external forces (loading). Extraction of underground minerals causes subsidence of ground surface due to gravitational forces. Dams encompassing water reservoirs undergo deformation due to loading of water and due to gravitational forces. Using the results of deformation monitoring, which supply the information about pattern and magnitude of deformation, the performance of the structure may be evaluated. Due to extended monitoring programs at DVL and PCS projects, combined with numerical modelling and analysis of long-term behaviour of rock and earth mass, it was possible to determine for each project site specific models of deformations. The integrated analysis of deformation allowed for verification of predicted displacements, determination of stress changes within structure, determination of the changes of material parameters, explanation of the unexpected behaviour, enhancement of the design of monitoring network, prediction of the changes of Young modulus.

Faculty Members and Graduate Students are invited to attend this presentation.