COMPUTER APPLICATION IN MINING

Objective:
For undergraduate students who are familiar with the basics of mining engineering as well as the fundamentals of computer programming, this course aims at giving them an over view of how the software used in mining engineering works.

Module I
Overview of computer programming with reference to pseudo codes, C and C++ languages. Principles of plotting pixels and a brief introduction to lines and curves as orderly combinations of pixels. Coordinate system of plotting Mine Survey data and the use of computer graphics for such plotting. Overview of the common well known software packages like Surpac, Intellimine, Crystal etc. **(12 hours)**

Module II
Introduction to computer applications in rock mechanics and support design, blast design, prediction and assessment of blasting results, mine ventilation calculations, dispatch scheduling and other mining applications. Scope and limitations of networking mine offices, stores, work shops etc. to enhance productivity and cost control. **(12 hours)**

Module III
Application of System Simulation to study and solve mining problems. Modeling and simulation of mineral handling and mineral beneficiation systems. Overview of a few well known simulation packages to Mineral processing like JKSIMET, MODSIM etc. **(12 hours)**

Text Books:

1. Fundamentals of Database Systems, Elmarsi and Navathe, 3rd edition, Wesley 2000.
2. CAD/CAM : Computer Aided Design and Manufacturing, Mikell P. Groover, Emory W. Zimmers, Jr. PHI Inida, 1989.

References:

1. Fishman, G. S. (1995). *Monte Carlo: Concepts, Algorithms, and Applications*. New York: Springer
2. Ripley, B. D. (1987). *Stochastic Simulation*. Wiley & Sons.
3. Computer Simulations in Science and Technology Studies by Ahrweiler, Petra, Gilbert Nigel, and F. Ahrweiler editors., Springer Verlag, 1998. ISBN# 3540648712
4. Advances in Stochastic Simulation Methods by Balakrishnan, N. et. al. editors., Birkhauser, 2000. ISBN# 0817641076
5. Simulation Fundamentals Bennett, Brian., Prentice Hall, 1995. ISBN#0138132623 [general]
6. Mineral Crushing and Grinding circuits, Simulation … by A.J.Lynch – Elsevier 2006
7. Modeling and Simulation of Mineral Processing Systems by Peter R. King – Amazon 2001
8. Mine Ventilation and Air Conditioning by Hartman – Wiley International 1961
9. Mine Environmental Engineering by V.S.Vutukuri& Lama – Cambridge University Press 1986