

**INDIAN INSTITUTE OF TECHNOLOGY KANPUR**  
**DEPARTMENT OF MANAGEMENT SCIENCES**  
**Proposal for New Course**

1. **Course Title:** Alert Models in Finance
2. **Course Number:** MBAXXX
3. **Credits:** 3-0-0-5(Modular Course)
4. **Proposing Instructor:** Dr. Parvati Neelakantan
5. **Proposing department:** Department of Management Sciences
6. **Pre-requisite Courses:** None
7. **Other Interested Faculty:** NA
8. **Course Description**

This module introduces the topic of alert models in banking, sharply focusing on their deployment and accountability in mitigating operational risk. Operational risk alert models are formulated and deployed, for the most part, to detect, prevent, and even predict suspicious and possibly fraudulent transactions. Instances include credit card fraud, defrauding the elderly, and money-laundering. These alert models also help in mitigating or preventing cyber security crime.

The module will enable students to make sense of impactful, vast, and complex data sets, i.e., “Big Data,” with a view to better understanding and anticipating operational risks intrinsic to banking. Vast data sets add value to an organization only when its algorithms elicit meaning from the data. The alert models and monitoring skills examined in this module are much valued in the industry.

9. **Topics Covered in the Course**

Topic	No. of Lectures
Use cases, Ideas, and Vocabulary; Performance Evaluation and Ethics	1
Regression	1
Classification	1
Resampling Methods	1

Linear model selection and regularization	2
Moving Beyond Linearity	1
Tree-Based Methods	2
Support Vector Machines	2
Deep Learning	2
Fairness Techniques for Alert Models	1

## 10. Reading Materials

### Textbooks

1. James, G., Witten, D., Hastie, T. and Tibshirani, R., 2023. *An Introduction to Statistical Learning*. Cham: Springer International Publishing.
2. Hastie, T., Tibshirani, R., Friedman, J.H. and Friedman, J.H., 2009. *The Elements of Statistical Learning: Data Mining, Inference, and Prediction*. New York: Springer.
3. Deisenroth, M.P., Faisal, A.A. and Ong, C.S., 2020. *Mathematics for Machine Learning*. Cambridge UP.
4. Wilmott, P., 2019. *Machine Learning: An Applied Mathematics Introduction*. Panda Ohana Publishing.

Signature of Proposers:



Parvati Neelakantan

22 February 2024

This course is Approved/ Not Approved

DPGC Convener, DoMS

This course is Approved/ Not Approved

Chairperson SPGC