



## **“ANALYTICS IN BUSINESS & PROJECTS”**

**February 2 - 13, 2014**

**Dr. Purba Rao and Dr. Satish Rao**

This 36-hour course will comprise two modules running in parallel: (i) a 21-hour module on Business Analytics to be taught by Dr (Mrs) Halady Purba Rao, and (ii) a 15-hour module on Project Analysis to be taught by Mr. Halady Satish Rao. The two modules, though distinct, will adopt a common approach of quantitative analysis and cover functional areas in a complementary manner. For example, *market analysis, human resource analysis and operations analysis* will be covered under Business Analytic module while some others like *structural, technical, financial, economic and environmental analysis* will be covered under the Project Analysis module.

### **A. Business Analytics Module: 21 hours: Dr (Mrs) Halady Purba Rao**

**Module Description:** Business Analytics in today’s world, refers to different approaches for modelling different business situations and arriving optimal decision making to achieve organizational goals. Some of these models strive to predict market preferences, customer segmentation in the primary target market, determine what factors lead to employee satisfaction, what factors lead to attrition, how to assess performance indicators for employees, assess and predict risk or shortage in inventory situation, factors leading to operations efficiency etc.

Business Analytics module will familiarize students in applying predictive modeling approaches to solve such business decision making problems, using statistical as well as heuristic and data mining approaches. The analytical approaches will include Significant testing of consumer preferences, Logistics Regression, Monte Carlo Simulation, RFM, CHAID, Conjoint Analysis as well as Structural Equation Modeling.

**Pre-Module Requirement:** The Module will require students to have a basic understanding of probability and statistics, significance testing concepts and multiple linear regression concepts. If they already know how to use SPSS, it will be an advantage, otherwise I just show SPSS to them in the class. Structural Equation Modeling will need AMOS software available to every student in their laptops. Also, while discussing Monte Carlo Simulation, we would like to model business situations by Crystal Ball software too. Thus Crystal Ball software also may be desired though not compulsory.

**Prescribed Text Book:** “*Business Analytics: An Application Focus*”, Purba Halady Rao, PHI New Delhi, 2013

**Evaluation Criteria:** Class participation, midterm and end term project

**B. Project Analysis Module: 15 hours: Mr Halady Satish Rao**

**Module Content:** This module will provide an analytical approach to (i) assess the viability of a project ex-ante (before start of the project), and (ii) evaluate a project ex-post (after construction of the project). For this, the course takes the student through a quantitative analysis of various factors that go into determining acceptance or rejection of a project such as technical feasibility, financial viability, economic cost-benefits, environmental sustainability and social acceptability.

This module will focus on large projects, mainly in infrastructure. Why infrastructure? One, it is the need of the hour in developing countries such as India. Two, infrastructure development is complex and poses unique challenges such as: (i) highly capital intensive and large initial costs (ii) social benefits being prioritized over private returns due to its “public goods” nature, thereby necessitating government subsidies, guarantees, viability funding etc., (iii) greater involvement of government (often, as a granter of “concessions” and acquirer of land) (iv) its “natural monopoly” characteristic requiring regulation by government/semi-govt/independent agencies (iv) significant environmental and social impacts that attract greater public scrutiny (v) the need for a long-term perspective due to long construction periods, slow revenue/profit build up and long project economic life, and arising therefrom, the need for long-term funds.

These infrastructure challenges pose substantial risks. To address this, one special approach is “Project Finance” that limits the sponsor risk (thorough non-recourse financing that relies on future cash flows of the project for debt-service payments) and allocates various project risks to the party best able to address these through contractual arrangements.

**Learning Objective:** The module will provide an understanding of key aspects of Project Analysis as applied to large infrastructure projects such as power, roads, oil pipelines etc.,. Apart from applying quantitative methodologies to determine project viability, the student will learn about the unique features and issues in infrastructure development, and the underlying concepts of “Project Finance” such as project structuring (eg,. Public-Private-Partnership) and risk allocation through contracts.

**Teaching Method:** The module will adopt a “lecture - case discussion - class exercise - home assignment” approach, supported by HBS (and other) cases, readings/reference materials and a book “*Project Financing: Asset-Based Financial Engineering, John D. Finnerty, 2<sup>nd</sup> Ed, May 2007*. The module will run for 10 sessions and comprise: Overview of Project Analysis (1); Structural Analysis (2); Technical Analysis (1); Financial Analysis (2); Economic Analysis (2); Environmental and Social Analysis (2).

**Evaluation Criteria:** End-exam, home assignments and class attendance-cum-participation.