NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI  
DEPARTMENT OF PRODUCTION ENGINEERING  
M. Tech (Industrial Engineering and Management)  
Total Credits: 60  
(operative for students of 2011-2012 admission)

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**LIST OF ELECTIVES**

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**Semester I**

**MA611 Data Analysis and Management & OM Lab1**  
L 2T 0P 2  
Credits 3

(This course is application based and SYSTAT Package is used for analysis part. Theory content is evaluated for 70 marks and Practical input is evaluated for 30 Marks)


**References:**


**PR651 Operations Research**  
L 3 T 0 P 0  
Credits 3


**References:**

PR653 Analysis and Control of Manufacturing Systems & OM Lab2 L2 T0 P2 Credits 3
(This course is application based and Cplex and GAMS Package is used for analysis part. Theory content is evaluated for 70 marks and Practical input is evaluated for 30 Marks)
Production system –Forecasting and its types – Forecasting errors and tracking signals - Inventory costs Terminology of Inventory systems – Inventory policies –Analysis of Static Deterministic Inventory Models- Aggregate Production Planning - Value stream management for lean office Introduction to material requirements planning - Lot sizing – MRP Versus MRP II – Re planning frequency in MRP Introduction to Job Sequencing – n Jobs, One machine – n Jobs, Two machines – n Jobs, Three machines – n jobs - Two Jobs , M Machines – n jobs, M Machines – sequencing Jobs on Parallel Machines – Minimization of Setup costs - Travelling Salesman problem –Job shop scheduling – Assembly line balancing

References:

PR 655 Human Resource Management L3 T0 P0 Credits 3

References:
4. Cary dessler ‘Human resources Management’ Printia Hall of India 9th edn.2003

PR 657 Systems Engineering L3 T0 P0 Credits 3

References:
Semester II

PR 652 Quality & Reliability Engineering L3 T0 P0 Credits 3
Concurrent engineering Quality function deployment – FMEA – Quality circles - Total quality management – Kaizen

References:

PR654 Modeling and Simulation & Simulation Lab L2 T0 P2 Credits 3
(This course is application based and SIMQUICK, ARENA, WITNESS, QUEST and GPSS Packages are used for modeling and analysis of manufacturing systems. Theory content is evaluated for 70 marks and Practical input is evaluated for 30 Marks)
Introduction to systems and modeling - discrete and continuous system - Monte Carlo Simulation. Random number generation Random variable generation – Testing -Analysis of simulation data - Input modeling – verification and validation of simulation models – output analysis for a single model. Simulation languages and packages Laboratory : General system modeling and simulation with ARENA, QUEST, GPSS, WITNESS, SIMQUICK and in C LANGUAGE

References:

PR656 Supply Chain Management and SCM Lab L2 T0 P2 Credits 3
(This course is application based and theory content is evaluated for 70 marks and Practical input is evaluated for 30 Marks)

References:
2. Logistics, David J.Bloomberg, Stephen Lemay and Joe B.Hanna, PHI 2002
4. Modeling the supply chain, Jeremy F.Shapiro, Thomson Duxbury, 2002

PR658 Finance management: L3 T0 P0 Credits 3

References:
Electives

Industrial Engineering stream

PR661 Scheduling algorithms L 3 T 0 P 0 Credits 3

References:

PR663 Computer Aided Process Planning and Control L 3 T 0 P 0 Credits 3

References:

PR665 Design and analysis of flexible manufacturing systems L3 T0 P0 Credits 3

References:

PR667 Research methodology L3 T0 P0 Credits 3

References:
PR669 Design and analysis of Experiments:  L3  T0  P0  Credits 3
Steps –Single Factor Experiments- ANOVA- Factorial Experiments- $2^k$ designs with Two and Three factors- Confounding, blocking, nested, Fractional factorial designs - Taguchi Techniques-
Quality Loss function, orthogonal designs, application to Process and Parameter design.

References:

PR671 Reliability safety and Maintenance:  L3  T0  P0  Credits 3

References:
2. Dhillon, B.S. “Maintainability, Maintenance and Reliability for Engineers”, CRC Press 2006

PR673 Enterprise Resource Planning  L3  T0  P0  Credits 3
ERP: An Overview - Benefits of ERP - ERP and Related Technologies - Business Process Reengineering (BPR), Data Warehousing - Data Mining, ERP Implementation - ERP Implementation Lifecycle, Business Modules in an ERP Package - ERP Market, Enterprise Integration Applications (EIA) - ERP and E-Commerce - ERP and Internet - Future Directions in ERP.

References:

PR675 Design and analysis of algorithms  L3  T0  P0  Credits 3
Algorithms, basic steps in development-Basic Tools-Top down, Structured programming, networks, data structure-Methods of Design-Sub goals, hill climbing and working backward, heuristics, back track programming, Branch and bound recursion process, program testing, documentation, Meta heuristics-Application-Development of sorting, searching, algorithms- combinatorial problems, shortest path, probabilistic algorithms.

References:
Lean and Agile Manufacturing

Inventory strategies-Lean manufacturing model-implementation of lean approaches 5S, kanban, kaizan Agile manufacturing production system-agile practice for product development-design for manufacture tools-product development time reduction-agile technology-flexibility of the facilities dysfunctional impacts of cost accounting-role of manager in agile organization-performance appraisal system.

References:

Facilities planning and design


References:

Production Management Systems

Productivity-productivity measurement models-role of work study-work measurement techniques-ergonomics-CIM and Production Management Systems- MRP I, MRP II Lot sizing in MRP-Lot for lot, economic order quantity-periodic order quantity-part period balancing-introduction to optimized production technology-KANBAN-types of KANBAN- value engineering (VE) - approaches of value analysis and engineering –Effective organization for value work, function analysis system techniques-FAST

References:
5. ILO-Introduction to workstudy, Geneva 1974

Advanced optimization techniques


References:
**Electives**

**Management stream**

**PR662 Information Management** L3 T0 P0 Credits 3
Information and Management - Information Systems analysis overview, Information gathering – sources -System Requirements specifications, Feasibility analysis, Data flow diagrams – logical and physical DFDs, Process specification methods, Decision tables-Logical database design – ER model, Normalizing relations; Data input methods; Database Management Systems – database design, Object oriented systems modeling-Designing outputs, Security of Information systems, E-commerce-System design example: Document and data flow diagrams, Feasibility of the system, System specifications, Database design, Control, audit and test plan

**References:**

**PR664 International Business Management** L3 T0 P0 Credits 3

**References:**
- Anil Kumar Sundaram and J Stewart Black International Business Environment Prentice Hall 1995
- Betty Jane Punnett Experiencing International Business and Management E-book 2010

**PR666 Project Management** L3 T0 P0 Credits 3

**References:**

**PR668 Marketing Management** L3 T0 P0 Credits 3

**References:**
PR670 Total Quality Management L3 T0 P0 Credits 3

References:


PR672 Technology Management L3 T0 P0 Credits 3

References:
5. Irvin M. Rubin, Organisational behavior an experimental approach, Prentice
6. Hall, 1995

PR674 Decision Support Systems L3 T0 P0 Credits 3
DSS components- Data warehousing, access, analysis, mining and visualization-modeling and analysis-DSS development -Group support systems- enterprise DSS- supply chain and DSS-knowledge management methods, technologies and tools-Artificial intelligence and expert systems- Representation in logic and schemas, semantic networks, production rules and frames, inference techniques.

References:

PR676 Knowledge management L3 T0 P0 Credits 3
Knowledge society- Drivers of knowledge management-Intellectual capital- KM and learning organizations-Strategic alignment- Evaluation and strategic alignment-Infrastructural development and deployment- Role of CKO-Analyzing business environment-knowledge audit and analysis – designing KM team, system–Technology components- Intranet and Groupware solutions- tools for collaborative intelligence- Social networking-package choices- knowledge security-Integrating with web -based and internal operational & support systems- change management- reward systems- continuous improvement

References:
PR678 Product Lifecycle Management  L3  T0  P0  Credits 3

References: