



SOS Children's Villages of India — Chatnath Homes, Madras.
"Loving home and a secure future for abandoned children
in 22 villages all over India"

'Mother and child' — Tanjore Painting —
Courtesy — private collection of Nandita Krishna



Season's Greetings

With Best Compliments

from *Dr. J. B. La. S.*

NATIONAL INSTITUTE FOR TRAINING IN
INDUSTRIAL ENGINEERING

VIHAR LAKE, BOMBAY 400 087

06 th December, 1985

NITIE

Dear sir,

I wrote a letter to you on 16th October and sent some of our Institute's informations. Hope, you have received the letter.

With regards,

Yours faithfully

Amrta K. S.



NITIE AND YOU

NATIONAL INSTITUTE FOR TRAINING IN INDUSTRIAL ENGINEERING





*It is good to have goodwill
It is good to have enthusiasm
but
It is essential to have training
— Jawaharlal Nehru*

Welcome to NITIE

We welcome you to NITIE as a participant in one of our programmes.

This small booklet will give you a brief outline about the activities of NITIE and facilities it offers to you.

The few minutes you spend in reading this booklet will help you to prepare yourself better for making your stay with us more comfortable and rewarding.

Wishing you all success in the programme.

Dr. S. Ramani
Director
NITIE, BOMBAY



NATIONAL INSTITUTE FOR TRAINING IN INDUSTRIAL ENGINEERING
VIHAR LAKE, BOMBAY 400 087

Telex : (011) 71392

Telephones Office : 58 33 71
Hostel : 58 33 74

Telegrams : 'NITIE
Bombay 76'

Your address while at NITIE :

Your Name : _____

Course Name : _____

C/o NITIE, Vihar Lake
Bombay 400 087.

SOME IMPORTANT TELEPHONE NUMBERS

NITIE Campus (Internal)

Asst. Registrar (Admn.)29
Transport Superintendent57
Hostel Superintendent.....53
Main Gate for Taxis55
Asstt. Registrar (Prog.).....26

Indian Airlines Enquiry6126343/6129534
Western Railway.....391611
Central Railway264321
Phonogram145
Trunk Call180

Introduction

NITIE (National Institute for Training in Industrial Engineering) was established in 1963 by the Government of India (Ministry of Education) with assistance from the United Nations Development Programme through the International Labour Organisation. It is an apex institution in India engaged in Education, Training, Research and Consultancy in the broad areas of Industrial Engineering, Operations Research and other Productivity and Management Sciences. It is administered through a Board of Governors representing Government, Industry, Education, Labour and the Engineering profession.

Courses and Programmes

NITIE offers the following types of programmes :

Executive Development Programmes :

From among the 152 courses of over 1 to 2 weeks duration — fully residential — according to the needs of Industry and availability of Faculty. 18,710 executives and specialists from all over India have participated till the end of 1983. List of courses on page 15 — (Annexure 1).

Unit Based Programmes :

Special programmes designed and structured to suit the specific needs of the organisations concerned. Organisations such as ACC, Parke Davis, Indian Airlines, Heavy Electricals, Hindustan Aeronautics, State Bank of India, BHEL, Bhopal, MSEB; BEST. Govt. of India (Deptt. of Personnel and Administrative Reforms), Hindustan Photo Films, MSRTC, TELCO, Mukand Iron, Hindustan Construction, Bajaj, Taj Mahal Hotel, Tata Consultancy Services, BEML, Hindustan Zinc Ltd., etc. have availed of this programme.

Senior Executive Programmes :

One week or shorter duration programmes, designed specifically for Top and Senior Executives, to create an awareness and understanding of the latest developments in productivity sciences.

Seminars and Conferences :

On Industrial Engineering, Operations Research, Computer Applications, etc. of 2 to 3 days duration in different parts of the Country and in the Campus.

Post-Graduate Programme in Industrial Engineering

Of 18 months duration, admission to the Post-Graduate Programme in Industrial Engineering at NITIE is restricted to graduates of Engineering and Technology of various Indian Universities or equivalent Institutions. Candidates must qualify through Graduate Aptitude Test in Engineering (GATE). The Industry sponsored candidates must have First Class Degree in Engineering (55% in the case of SC/ST) candidates.

There are at present 50 seats. Five per cent of the seats are reserved for Scheduled Caste/Tribe candidates. In addition, there are 10 seats provided for industry — sponsored candidates.

The Post-Graduate Diploma in Industrial Engineering awarded by NITIE is equivalent to M.Tech. degree. The programme takes cognizance of the emerging patterns of Industrial Engineering education, the growth of technology, the changing needs of organisations and the development of new areas.

Post-Graduate Diploma in Industrial Engineering (By Research)

It is open to candidates with a First Class degree or High Second Class in any branch of Engineering or Technology or equivalent qualifications and Four Years of relevant working experience in organisations of repute. Candidates must be sponsored by the respective organisations.

The Post-Graduate Diploma in Industrial Engineering (By Research) is a Master's Level Programme, for external candidates. The objective is to provide opportunity for candidates with practical experience for an indepth specialisation in selected areas of Industrial Engineering, and to enhance their capability in the design and operation of man-machine systems.

Fellowship Programme in Industrial Engineering

It is open to candidates with a First Class Master's Degree or its equivalent in Engineering or Technology or Business Administration preceded by Bachelor's Degree in Engineering or Technology or Outstanding Bachelor's Degree in Engineering or Technology.

The Fellowship Programme is a Doctoral Level Programme in Industrial Engineering with the objective to prepare students for careers in teaching and application of research in Industrial Engineering (IE).

Applied Research :

For evolving and adapting Industrial Engineering techniques to suit Indian conditions and to enhance the professional capabilities for training and education.

Consultancy :

Consultancy services are offered to help organisations to increase their productivity by using the latest techniques and methodologies that are relevant to the Indian environment. Assignments are accepted on a selective basis.

Computer-based Management Information System :

To design Computer-based management Information System and train Systems Specialists and Electronic Data Processing personnel.

Faculty

NITIE faculty, drawn from various basic disciplines, have diverse experience in Business, Industry and Government. **Annexure II** gives a list of faculty members and their areas of specialisation. This is supplemented by a number of guest faculty with specialised know-how and expertise in various fields.

Location

NITIE is situated in North Bombay in one of the most picturesque surroundings of the City and is flanked by the Powai and Vihar Lakes. Other Institutions and Organisations in the vicinity are the Indian Institute of Technology, Aarey Milk Colony, Larsen & Toubro Works complex, Swami Chinmayananda Ashram etc. Churchgate, Fort, Colaba and other down-town areas are about 35 kms south of the Campus.

Climatic Conditions.

Bombay has a fairly equable climate. The broad seasonal divisions are as follows :

Months	Season	Average Temperature	
		Max.	Min.
June to September	Monsoon	30°C	25°C
October to November	Post Monsoon	32°C	24°C
December to February	Winter	29°C	20°C
March to May	Summer	32°C	27°C

Facilities

NITIE is a residential Institution and has the following physical facilities for the participants : 4 class rooms, 1 Seminar room and an auditorium (All air-conditioned); three class rooms and 2 syndicate rooms (non air-conditioned).

A Library of more than 32,000 books, 2,900 bound volumes and 328 technical journals.

Self-contained residential accommodation for 200 participants and PGP students with attached amenity-cum-Dinning hall.

When to report at NITIE for the course :

Your course at NITIE commences on a Monday, and you are requested to arrive at the Campus on the previous day (Sunday) — before 9.00 p.m. to avoid inconvenience.

Checking out time is given on page 12. Boarding and Lodging Charges for the period earlier to checking-in time and beyond checking-out time will be borne by you.

Rail Connections :

Bombay is the terminus for the Western and Central railway and is connected to all the major cities in India. Suburban trains run from Bombay V.T. to Kalyan on the Central Railway and from Churchgate to Virar on the Western Railway at intervals of 5 minutes. The nearest Railway Station viz. Andheri on the Western Railway is also connected to Bombay V.T. on the Central Railway. The exact timings can be had from Supdt. (Hostel).

Road Connections :

State Transport buses connect Bombay with important tourist centres such as Poona, Nasik, Goa, Aurangabad and Mahabaleshwar.

Small and large metered taxis painted yellow and black are also available in the city. Three wheelers are also available to go upto Sion and Bandra.

How to reach NITIE :

NITIE is accessible by road from the principal transport terminals of the City (see the map appended) : Approximate distances and taxi fares from important points to NITIE are given below :

Place	Distance (approx.)	Taxi Fare (approx.)
	Km.	Rs.
Santacruz Airport	13	35
Victoria Terminus — C. Railway	29	75

Place	Distance (approx.)	Taxi Fare (approx.)
	Km.	Rs.
Churchgate — W. Railway	32	80
Bombay Central — W. Railway	24	60
Dadar C. & W. Railway	18	45
Vikhroli — C. Railway	10	22
Andheri — W. Railway	11	25

Institute vehicles are not available to reach NITIE from Railway Stations/Air Port or to go to Railway Station/Air Port at the end of the course except when it is at odd hours but subject to availability of vehicle/driver and on payment of specified charges in advance. Participants may however use NITIE Staff Buses on Saturday morning going to Andheri/Vikhroli Railway Stations.

What you should bring with you

As NITIE is a residential institution, arrangements are made for your board and lodge in the Campus itself. On page 8, details of the facilities and equipment provided to you at the hostel are given. You may bring with you your clothing, accountments, sportsgear, toiletries, etc. as required for the duration of the course. Warm clothing will not ordinarily be required except during December to February. It is advisable to bring a raincoat or an umbrella during the monsoon season. (Also see Page 5).

Whom to report upon arrival at NITIE

As you enter the Campus and proceed towards the main building, you will notice a sign board on your left and you will see Hostels No. 1 & 2, where you can contact the Supdt. (Hostels). The Supdt. (Hostels) will arrange for your accommodation and put you in touch with the Course Leader and the Asstt. Registrar (Programme), if required.

Registration

When you check-in at the Hostel you will be given a form at the counter to write your name, home and office address. Please fill this form **correctly** and **legibly** at the counter itself and return it immediately. This is important as this information goes in your record and your **CERTIFICATE** is prepared as per the name written on this form. Request for change in name will **NOT** be entertained at a later stage.

Hostel Accommodation

Supdt. (Hostels) will allot you a self-contained single room and if necessary, will arrange to show you round the amenity block, participants lounge, reading and recreation areas, dining hall etc.

Under exceptional circumstances, you may be required to share your room with another participant of your course in which case you will be accommodated in a bigger room.

Hostel Room and Services

You will be provided with the following items of furniture and equipment in your room :

Cot and mattress with sheet	Clothes hangers
Pillow with cover	Tea poy
Blanket and mosquito net (on demand)	Towels
Writing table with cover	Water jug with glass
Office Chair	Easy Chair
	Table lamp

Bath rooms are fitted with a wash basin and mirror and furnished with a plastic bucket.

A built-in cupboard is provided in the room for keeping your valuables. In your own interest, it is suggested to bring your own lock and key for the cupboard.

Twice a week (except in Monsoon), the linen in the Hostel room will be changed. The rooms are cleaned everyday between 7.30 am and 4.00 pm. You are advised to lock the room when you leave and hand over the key to the Hostel Attendant at the counter in order to enable him to open the room for cleaning.

NO GUEST OR FAMILY MEMBER IS ALLOWED TO STAY IN THE HOSTEL.

Meals Service

Meals and refreshment will be available at the following timings.

Bed Tea	Between	6.00 am	and	7.00 am
Breakfast	"	7.30 am	"	9.00 am
Lunch	"	12.30 pm	"	2.00 pm
Evening Tea	"	4.30 pm	"	6.00 pm
Dinner	"	7.30 pm	"	9.30 pm

You should inform the Superintendent (Hostel) well in advance in case —

You want to have a change in diet for breakfast/lunch/dinner (under medical advice).
you require any extra meals/service (on payment)

A register is kept in the Supdt. (Hostel)'s office and you are requested to mark absence for Saturdays, Sundays and Holidays in case you intend going out.

Entertainment of Guests

The participants are allowed to entertain guests or family members in the Dining Hall, against cash payment, with prior intimation to the Superintendent (Hostels)/Catering Contractor.

Tariff for Canteen Services

For items ordered extra, rates prevalent from time to time will be charged. Details of the current rates may be ascertained from the Hostel Office/Notice Board.

Dhobi Services

The Hostel Dhobi will collect and deliver clothes to participants every day between 7.00 am and 9.00 am and 5.00 pm and 7.00 pm respectively.

Payment may be made directly to the Dhobi as per the contract rates displayed on the Hostel Notice Board.

Alcoholic Drinks

Alcoholic drinks (including Beer) will, under no circumstances, be consumed in the Dining Hall or the Lounge.

Telephone & Telex

Local calls can be made either through the Receptionist-cum-Telephone Operator in the Academic Building (ground floor) or from the Counter of the Hostel on payment of 50 paise per call. A list of internal telephone numbers at NITIE is displayed at the Hostel Office.

Trunk Calls and Phonograms can also be made on payment with the prior permission of the Asst. Registrar (Admn.) The details of the calls may be entered in the register kept near the Telephone Operator and the Hostel Superintendent. Telex facility is also available in the Institute. Telex messages may be transmitted from the office with the permission of the Asstt. Registrar (Admn.) and on payment.

Contact the Hostel Reception Counter for any message expected.

Mail Services

NITIE post office is located near the main gate. The outgoing mail may be deposited in the post box kept outside the office of the Supdt. (Hostels). The mail is cleared twice on week days at 11.00 am and 3.15 pm. Your mailing address in NITIE will be Course Name, C/o NITIE, Vihar Lake, Bombay 400 087. Incoming mail will be put up on the Hostel Notice Board.

Medical Facilities

Campus Dispensary is situated in Old Type V Bldg., Flat No. 10. The working hours are displayed on Notice Board.

Banking facility

You may avail of banking facility at the NITIE Extension Counter of the State Bank of India (IIT, Powai Branch) situated in NITIE Campus. SBI Travellers cheques can be cashed here.

Transport

Public transport BEST buses are available as under :

- | | |
|---------------------|---|
| Route No. 184 Ltd. | — Andheri Railway Station (East) to NITIE between 7.00 am and 9.00 pm |
| Route No. 336 & 337 | — Andheri Railway Station (East) to Vikhroli (via Powai Point near Larsen & Toubro Ltd.) between 6.00 am and 11.30pm. |
| Route No. 323 | — Vidyavihar Railway Station (Central Railway) from Powai Point between 6.00 am and 11.30 pm. |
| Route No. 396 Ltd. | — Andheri Railway Station (East) to Mulund Railway Station (via Powai Point near Larsen & Toubro Ltd.) between 6.00 am and 9.30 pm. |
| Route No. 398 Ltd. | — Borivili on the Western Railway to Mulund on Central Railway via Powai Point between 6.00 am and 9.00 pm |

Route No. 183 Ltd.

- Maharani Laxmibai Chowk (Sion) and NITIE between 7.00 am and 9.00 pm on Sundays and Holidays (this facility will not be available during monsoon season — June-September).

Contact the Hostel Reception Counter for taxi/scooter service.

Sight Seeing

Information is available in the folder "Bombay Seeing Tours" kept with the Hostel Superintendent. Sight seeing tourist buses are arranged by the Tourist department. Motor launches leave for the famous Elephanta Caves every morning from the Gateway of India. Launch service is closed during the monsoon from June to September.

The Institute also arranges a picnic-sight seeing tour on Sundays for participants of two-week or more duration EDP courses.

Check—out Time

Checking-in-time is the proceeding day of the commencement of the course and checking-out time is on the following day at the conclusion of the course. Boarding and Lodging Charges for the period ealier to checking-in-time and beyond checking-out time will be borne by you. For UBP/SEP etc. separate conditions apply. For UBP, please see Information sheet at Annexure III.

Journey Tickets and Reservations

In view of the difficulties regarding Railway/Air Reservations ex-Bombay, you are requested to arrange your return journey reservation from your end itself. However, if you send to the Superintendent (Hostels) the details of your return journey and a Demand Draft drawn in favour of NITIE payable at Bombay covering the expenses, he will refer your request to our Travel Agents. Our Travel Agents handle reservations for Air Journey and First Class rail journey only. While the Agents do not levy any service charge for Air Tickets, they levy a service charge of Rs. 10/- for every First Class rail ticket which will have to be included in your Demand Draft. However, the Agents do not guarantee reservations as per requests referred to them.

Library

NITIE has a well equipped Library with more than 32,000 technical books and 2,900 bound volumes. The Library also subscribes to 328 technical journals covering the different subjects in Industrial Engineering/Behavioural and Computer Sciences/Finance/Personnel Management etc.

Library timings are from 9.00 am to 11.00 pm including Sundays but excluding NITIE Holidays. It works on open access system. You can borrow two books at a time. All books borrowed must be returned to the Library before the last day of your course.

Reading Room

There is a reading room in front of the Office of the Supdt. (Hostels), where newspapers and magazines will be available for reading from 7.30 am to 11.30 pm. If you need a copy of any journal on payment, please inform the Supdt. (Hostels), for arranging the same with the newspaper vendor. Stereo radio-gram and TV facilities are also provided.

Stationery

A folder containing stationery requirements like paper, pencil, eraser, graph paper; etc. will be placed in your desk in the Class Room on the first day of the course. All stationery will be supplied.

Discussion with faculty

Your Course Leader will be your guide during the period of the course. Where necessary you may also consult other faculty members as convenient to both.

Get-together & Group Photograph

A welcome tea and valedictory get-together and group photograph are arranged by the Institute. Copies of the group photo are made available to the participants free of charge.

Games and Recreation

Facilities for indoor games such as Table Tennis, Carrom, Playing Cards and Chess are available in the Hostel between 3.30 pm and 9.30 pm. Table Tennis balls and shuttle cocks are available with the Hostel Attendant on cash payment. Badminton Court is located in the Gymkhana Hall near the main building. However one TT Ball, Shuttle Cock is issued free.

Every Tuesday feature films (Indian and/or English on alternate weeks) are screened in the Auditorium at 6.30 pm free of charge for the participants.

Complaints and Suggestions

A complaint register is kept in the Hostel Office in which you may record your complaints regarding sanitary fittings, lights, fans, etc. for corrective actions. A suggestion book is also available for your suggestions for improvement.

NITIE Alumni Association

Before leaving NITIE you are welcome to become member of NITIE Alumni Association on a nominal payment of Rs. 5/- as entrance fee and Rs. 20/- as annual subscriptions. This membership will ensure your constant contact with NITIE and its activities through NITIE Journal — UDYOG PRAGATI.

LIST OF COURSES RUN/DEVELOPED AT NITIE

- | | | | |
|----|---|----|---|
| 1 | Advanced Organisation & Methods | 25 | Distribution Management |
| 2 | Advanced Work Measurement | 26 | Distribution & Warehousing Management |
| 3 | Audio-Visual Aids in Industrial Planning | 27 | Economic Analysis for Managerial Personnel |
| 4 | Applied Statistics in Production Planning | 28 | Evolutionary Operations (EVOP) |
| 5 | Analytical Techniques for Production Personnel | 29 | Environmental Planning & Design |
| 6 | Advanced Work Study | 30 | Ergonomics |
| 7 | Advertising Management | 31 | EDP Audit & Soft Security |
| 8 | Achievement Motivation for Higher Productivity | 32 | Energy Conservation in Industry |
| 9 | Business Statistics | 33 | Energy Management |
| 10 | Budgetary Control | 34 | Environmental Pollution and Control |
| 11 | Business Environment and Forecasting | 35 | Effective Managerial Delegation |
| 12 | Communication in Industry | 36 | Effective Leadership Styles |
| 13 | Computer Systems Analysis & Design | 37 | Facility planning Management |
| 14 | Cost Estimating & Pricing | 38 | Financial Management |
| 15 | Cost Reduction | 39 | Finance for Non-Finance Executives |
| 16 | Cost Reduction for Light Engineering Industries | 40 | Financial Strategies & Corporate Planning |
| 17 | Computers in Materials Management | 41 | Human Relations |
| 18 | Computer Based Project, Planning & Control | 42 | Hospital Administration |
| 19 | Computerization-Analysis Planning & Preparation | 43 | Housing Management Development |
| 20 | Computer Systems Performance Evaluation & Selection | 44 | Hospital & Public Health Administration |
| 21 | Computer based Cost Control Systems | 45 | Incentive Wage Systems |
| 22 | Construction Management | 46 | Industrial Engineering for Industrial Administrators |
| 23 | Capital Budgeting | 47 | Industrial Experimentation (for Chem & Pharma Industries) |
| 24 | Decision Making | | |

- | | | | |
|----|---|-----|---|
| 48 | Industrial Energy Conservation Strategies | 74 | Motivation Techniques |
| 49 | Industrial Relations for Trade Union Leaders | 75 | Market Research & Product Planning |
| 50 | Industrial Relations for Higher Productivity | 76 | Marketing Research |
| 51 | Information Systems for Financial Management | 77 | Manpower Planning & Development |
| 52 | Information Systems for Materials Management | 78 | Management of Urban Government |
| 53 | Investment Planning & Project Evaluation | 79 | Managerial Skills for Technical Personnel |
| 54 | Industrial Marketing | 80 | Management of Managers |
| 55 | Integrated Loss Control in Industry | 81 | Marketing for Non-Marketing Executives |
| 56 | Investment Planning | 82 | MBO for Engineers |
| 57 | Information Systems Development Using Small Business Computers. | 83 | Management of Mass Production System |
| 58 | Job Evaluation & Merit Rating | 84 | Materials Executive & Computer Application |
| 59 | Job Evaluation for Trade Union Leaders | 85 | Marketing for Bank Executives |
| 60 | Job Evaluation | 86 | Management Techniques for Finance Personnel |
| 61 | Linear Programming | 87 | Materials Handling |
| 62 | Long Range Planning | 88 | Modernising Production Facilities |
| 63 | Maintenance Management | 89 | Noise Control in Industry |
| 64 | Management Controls | 90 | Organisation & Methods |
| 65 | Management Information Systems | 91 | Operations Research |
| 66 | Management Techniques for Accountants | 92 | Organisation & Techniques of Training |
| 67 | Managerial Effectiveness | 93 | Occupational Safety & Health |
| 68 | Materials Handling and Plant Layout | 94 | Performance Appraisal & Counselling Skills |
| 69 | Materials Management | 95 | Performance Budgeting |
| 70 | Management by Objectives | | Personnel Administration for Non-Personnel Executives |
| 71 | Management of R & D | 96 | Executives |
| 72 | Method Study | 97 | Precedence Network |
| 73 | Micro-Computers Based Information Systems Design | 98 | Predetermined Motion Time Standards |
| | | 99 | Process Planning |
| | | 100 | PERT/CPM |

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|-----|---|-----|--|
| 101 | Production Engineering | 127 | Stores & Inventory Control |
| 102 | Production Management | 128 | Systematic Plant Maintenance |
| 103 | Production Planning & Control | 129 | Systems Documentation for EDP Personnel |
| 104 | Project Management (Computer Based) | 130 | Simulation for Decision Making |
| 105 | Production Supervision | 131 | Sales Management & Sales Promotion |
| 106 | Productivity Programmes for Small/Medium Industry | 132 | Spare Parts Management |
| 107 | Project Management | 133 | Software Development for Mini Micro Computers |
| 108 | Personnel Administration & Industrial Relations | 134 | Transport Planning |
| 109 | Purchasing Management | 135 | Technological Forecasting |
| 110 | Planning Future | 136 | Transportation Planning & Management |
| 111 | Profit Planning & Profit Control | 137 | Urban System Planning |
| 112 | Productivity Services for Process Industry | 138 | Value Engineering |
| 113 | Productivity Linked Wage Incentives | 139 | Why Computer Based Information Systems Fail |
| 114 | Personnel for Non-Personnel Executives | 140 | Work Measurement |
| 115 | Personnel Information Systems | 141 | Work Study |
| 116 | Personnel Selection Techniques | 142 | Water Resource Management |
| 117 | Production Executive & Operations Research | 143 | Working Capital Management |
| 118 | Planning & Evaluation of Management Training | 144 | Workshop on Case Study |
| 119 | Project Formulation & Appraisal | 145 | Workers Participation in Management |
| 120 | Quality Control Reliability & Cost Effectiveness | 146 | Workshop on MIS |
| 121 | Quantitative Analysis for Production | 147 | Working Capital Management — A Quantitative Approach |
| 122 | Quality Control | 148 | Workshop on Inventory Control |
| 123 | Quantitative Analysis for Corporate Planning | 149 | Inventory Management Workshop |
| 124 | Quantitative Economic Analysis for Corporate Planning | 150 | Workshop on Slide Tape Training Packages |
| 125 | Rating Workshop | 151 | Workshop on Effective Training Through Media |
| 126 | Reliability Improvement & Optimisation | 152 | Workshop on Optimisation Techniques for Engineers and Scientists |

NITIE FACULTY

Dr. S. Ramani — Director

<i>Name</i>	<i>Field of Specialisation</i>
Agrawal RK	: Industrial Engineering, Project Management, Plant Maintenance.
Bhattacharya D (Dr.)	: Physics, Chemistry, Maths, Chemical Engineering, Flow Properties of Grannular Solids.
Bhattacharya R (Mrs.)	: Science Stream, Mathematics, Physics and Chemistry, Numerical Analysis and Automatic Computing.
Biswas PK	: Digital Signal Processing and Computer Software.
Blaggan KK Dean (Consultancy Services & Sponsored Projects)	: Industrial Engg., Information Systems & Computers, Organisation Design, Job Evaluation & Wage Incentives, Facility Location Optimisation.
De Amitabha	: Ergonomics, Work Physiology.
George C	: Industrial Engineering, Project Management.
Ghosh Sadhana (Mrs.)	: Applied Statistics, Computer Science.
Gopalan VK Dean (Programme Development EDP/UBP/SEP, etc.)	: Marketing, Cost Estimation, Financial Management, Corporate Planning.
Jayasankar V (Dr.)	: Industrial Engineering, Industrial Management.

- Joshi PL (Dr.) : Financial Management, Business Accounting & Auditing.
- Kochar IPS (Dr.) : Operations Research, Energy & Power Management, Reliability Studies, Computer Systems.
- Mathur HB (Dr.) : Personnel Management and Industrial Relations, Training Techniques, Human Relations, Organisation Development, Organisational Behaviour.
- Mohanty RP (Dr.) : Industrial Engg. & Operations Research General Management, Large Scale
Incharge of Research Programmes Systems Optimisation.
- Mukhopadhyay SK (Dr.) : Maintenance Management, Production Planning & Control, Production Management.
- Muthukrishnan K : Industrial Engineering, Production Control & Materials Management, Management Accounting, Production Planning and Control Systems.
- Nandkumar P (Dr.) : Human Resources Management, Industrial Relations with emphasis on Human Related Side and Organisational Behaviour.
- Narang RV : Industrial Engineering, Materials & Production Management, Organisation & Methods.
- Narayanan N : Production Planning & Control, Materials Systems, Optimisation Techniques.
- Palwankar RC (Miss) : Marketing.
- Philipose S (Mrs.) (Dr.) : Operations Research, Quality Control, Statistics.
- Raja S. (Dr.) : Ergonomics (Human Engg.) Work and Environmental Physicology, Noise & Hearing.

- Rao BS : Systems Dynamics (Business Policies), Large-Scale Systems Design (Modelling), Computers (Structured Design, Data Base Management Systems, Data Communications).
- Ravishankar R (Dr.) : Organisational Behaviour & General Management, Personnel Management & IR, Human Resources Development and Management Training, Public Enterprise Management, Management of Education.
- Rastogi SC : Industrial Engineering, O.R., Computer Aided Optimisation.
- Sayeed OB (Dr.) : O.D., Organisational Health and Effectiveness, Quality of Working Life.
- Shamanna K (Dr.) : Organisational Behaviour, Management Development.
- Sheth Madhuri G. (Mrs.) (Dr.) : Organisational Behaviour, Industrial Relations, General Management, Personnel Management.
- Srinivasan G (Dr.) : Management Accounting, Financial Management and Costing.
- Srivastava RK : Industrial Engineering, Project Management, Production Management.
- Sukhatankar LM : Industrial Engineering, Production Management, Materials Handling, Facilities Planning.
- Thiripal Raju (Dr.) : Financial Management, Portfolio Management, Computer-Based Financial Information Systems.
- Thomas Mathew (Dr.) : Industrial Engineering, Project Management General Management, Development Studies, Business Finance, Business Policy.
- Unnikrishnan E (Dr.) : Mechanical Engineering, Industrial Engineering & Administration.

- Vasant Rao M
Professor for Trg. & Placement
& Prog. Development : Project Management, Job Evaluation, Value Engineering.
- Venkateswarlu (Dr.) : Quality Control Reliability Engineering, Operations Research.
- Venkoba Rao TS : Production Management, Communications, Managerial Development.

OFFICERS

Registrar

S. L. Chaudhary

ASSISTANT REGISTRARS

Gurjar SK (Programme)

Purohit JN (Accounts)

Shetty AP (Audit)

Karande KR (Academic)

Rajagopalan P (Administration)

Venugopalan K (Board & Ministry)

MEDICAL OFFICERS

Deshmukh SB (Dr.)

Deshmukh SS (Mrs.) (Dr.)

SR. LIBRARIAN

Joshi PG (Mrs.)

SYSTEMS DESIGNER

Raoot AD

INSTITUTE ENGINEER

Kathare RP

PROGRAMMERS

Ashok K

Mohan Mathew

Mukhopadhyay AK

Terms and Conditions and Information on UNIT BASED PROGRAMME

Unit Based Programme, known as UBP, is a training programme tailor-made to the specific requirements and needs of a particular organisation.

Before undertaking UBP a Pre-Training Survey of one to two days duration is conducted by one or two of NITIE faculty member/s with a view to assess the exact requirements and with a view to structure and design the UBP. The terms for PTS are as under :

I. Pre-Training Survey (PTS)

1. Fee — Rs. 500/- per contact day
2. Travelling expenses of faculty member/s to & fro — by air or by first class AC coach
3. Boarding and lodging expenses of the faculty member/s at destination
4. Local transportation at both ends.

On the basis of the assessment made, a suitable UBP is drawn up in consultation with the authorities of the organisation and the UBP is conducted either at the premises of the organisation or at NITIE.
The terms of UBP are :

II. UBP at the Premises of the Organisation

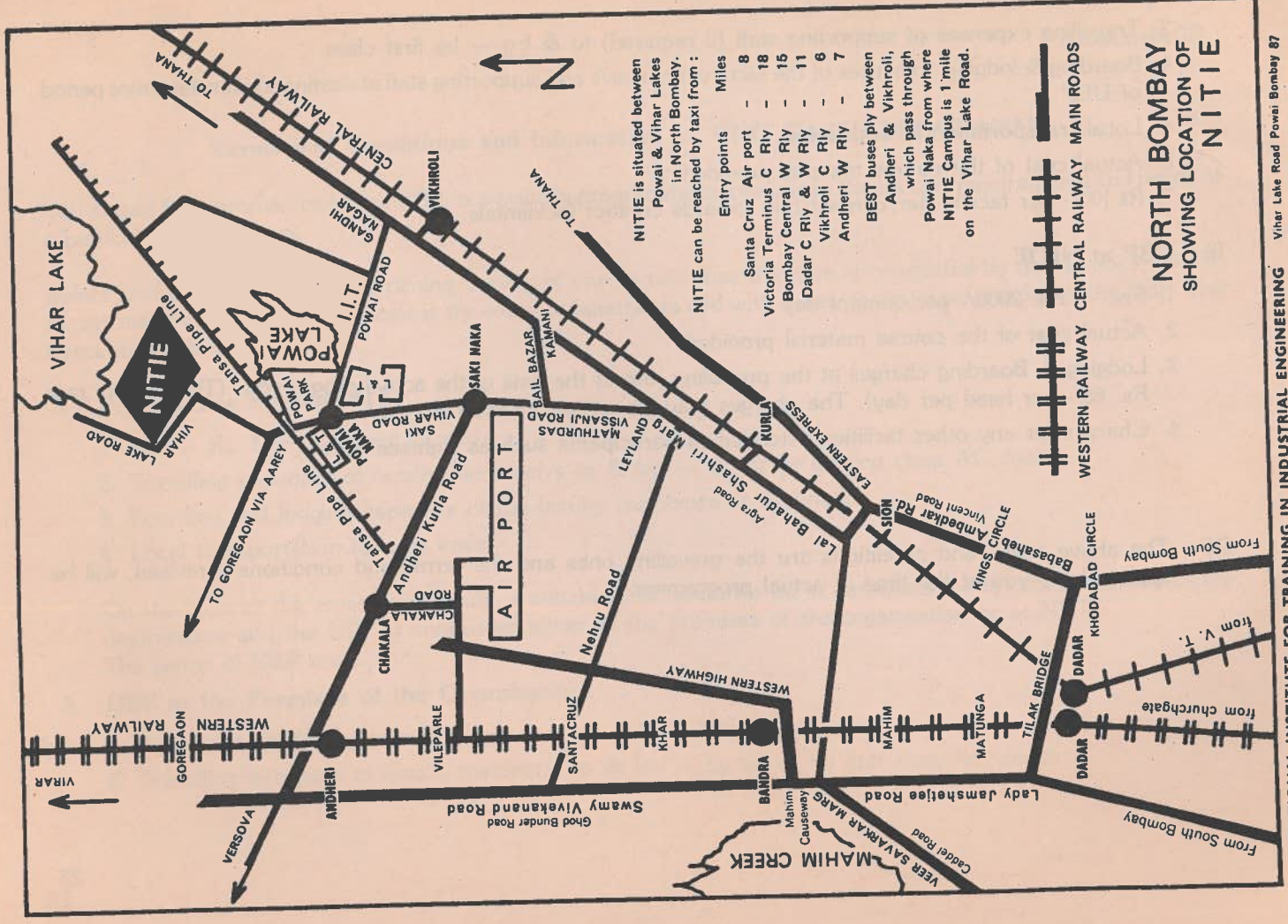
1. Fee — Rs. 2000/- per contact day
2. Travelling expenses of faculty member/s to & fro — by air or by first class AC coach

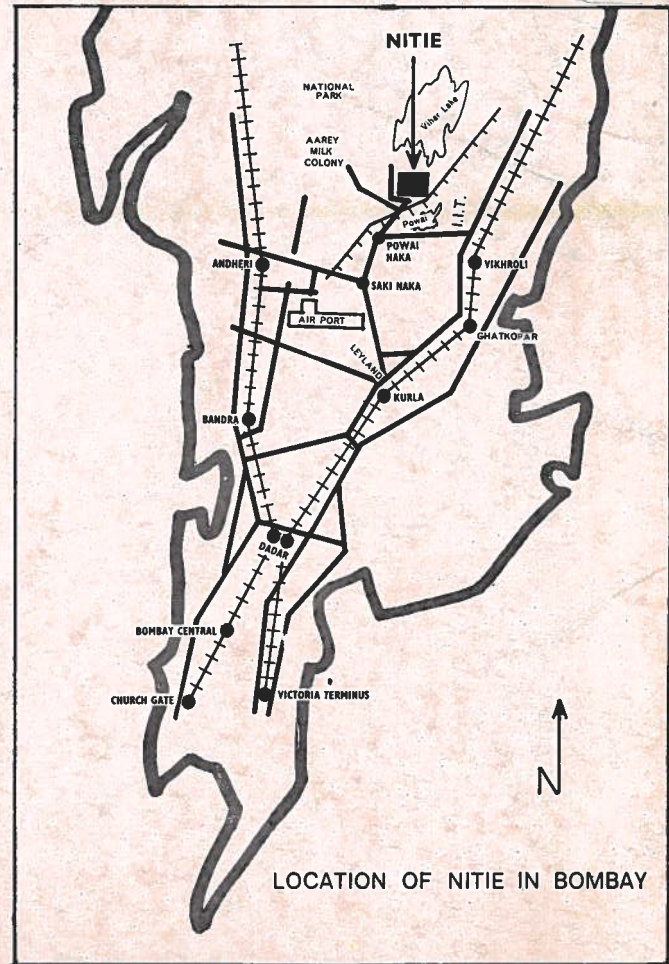
3. Travelling expenses of supporting staff (if required) to & fro — by first class
4. Boarding & lodging expenses of the faculty member/s and supporting staff at destination for the entire period of UBP
5. Local transportation at both ends
6. Actual cost of the course material provided
7. Rs.100/- per faculty per contact day towards contact incidentals.

III. UBP at NITIE

1. Fee — Rs. 2000/- per contact day
2. Actual cost of the course material provided
3. Lodging & Boarding charges at the prevailing rate at the time of the actual programme. (The present rate Rs. 85/- per head per day). The charges may be revised at short notice.
4. Charges for any other facilities extended to participants such as sightseeing, etc.

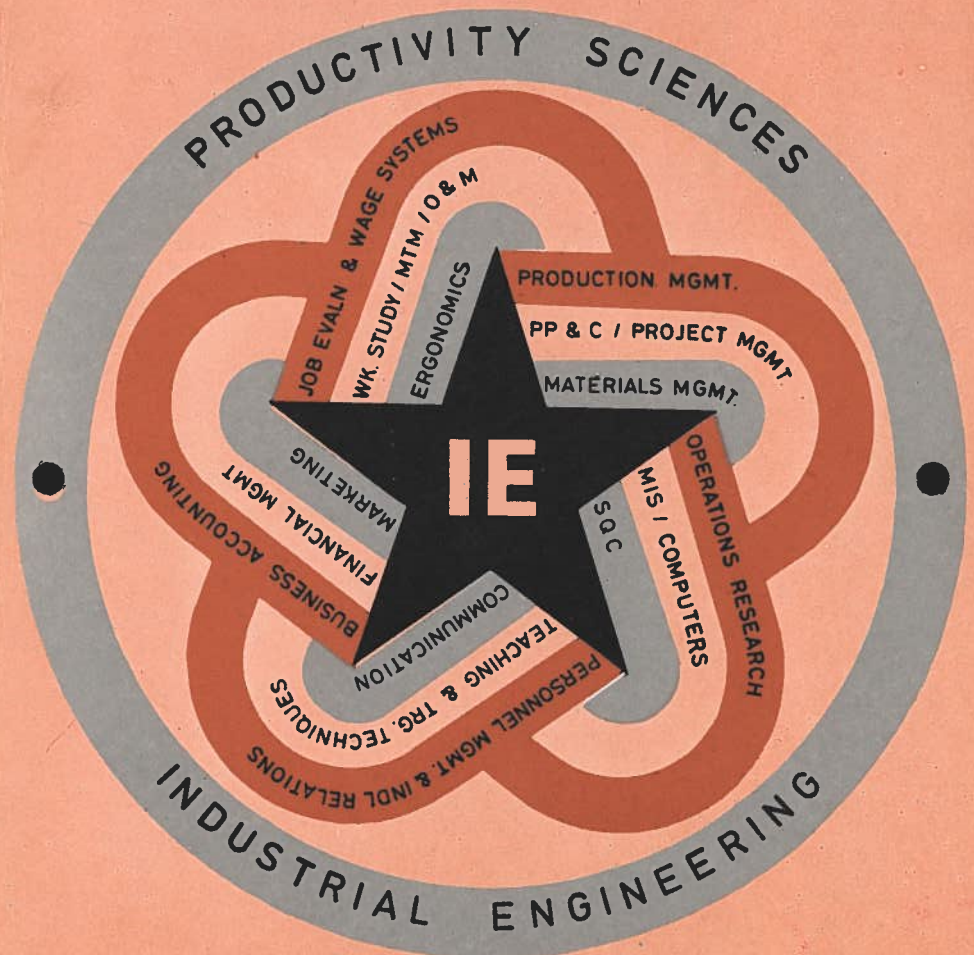
PS : The above terms and conditions are the prevailing ones and the terms and conditions if revised, will be applicable to you at the time of actual programme.







RESEARCH PROGRAMMES IN INDUSTRIAL ENGINEERING COMMENCING FROM 1985



NATIONAL INSTITUTE FOR TRAINING IN INDUSTRIAL ENGINEERING

VIHAR LAKE, BOMBAY-400 087.

GRAM : NITIE, BOMBAY 76

TELEX : (011) 71392

PHONE : 58 33 71



The Lawn

**RESEARCH PROGRAMMES
IN
INDUSTRIAL ENGINEERING
COMMENCING FROM 1985**

- FIE — FELLOWSHIP IN INDUSTRIAL
ENGINEERING
- PGDIE — POST-GRADUATE DIPLOMA IN
INDUSTRIAL ENGINEERING
(BY RESEARCH) FOR EXTERNAL
CANDIDATES

**NATIONAL INSTITUTE FOR TRAINING IN
INDUSTRIAL ENGINEERING**

**VIHAR LAKE, BOMBAY 400 087.
(INDIA)**

Telephone : (022) 583371

Telex (011) 71392 NITI IN

Gram : NITIE, Bombay 400 076

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1. Calendar

ADMISSION

Last date for receipt of applications : 8th April, 1985

Written Test/Group Discussion/
Interview at Bombay

Intimation of final selection to the
candidates

Last date for acceptance of admission by
candidates

Will be communi-
cated to the candi-
dates separately.

ACADEMIC

The courses required to be taken by the students will be offered in different quarters coinciding with the schedule of quarters applicable to 18 month Post Graduate Programme.

BOARD OF GOVERNORS, NITIE, BOMBAY-400 087

Chairman	Shri B. M. Gogte, 146, Tilakwadi, BELGAUM-590 006.
Representatives of Central Government Finance	Financial Adviser (Education), Ministry of Education & Culture, Government of India, Room No. 109, 1st Floor, C-Wing, Shastri Bhavan, NEW DELHI-110 001.
Education	Shri M.S. Srinivasan, Jt. Educational Adviser (T), Ministry of Education & Culture, Government of India, Shastri Bhavan, NEW DELHI-110 001.
Ministry of Industrial Development	Shri P.R. Latey, Director General, Tech. Devpt., Directorate General of Technical Development, Udyog Bhavan, Maulana Azad Road, NEW DELHI-110 011.
Representative of National Productivity Council	Dr. A.N. Saxena, Director General National Productivity Council, Productivity House, Lodi Road, NEW DELHI-110 003.
Representative of All India Council of Technical Education	Shri Duleep Singh, Chairman & Managing Director, Rashtriya Chemicals & Fertilizers Ltd., Trombay Plant, BOMBAY-400 074.

Four Representatives of
Industry including Public
Enterprises Nominated by
Central Government

Shri S. Vangala,
Managing Director,
Vijayanagar Steel Ltd.,
Shankaranarayana Bldg.,
25, Mahatma Gandhi Road,
BANGALORE-560 001.

Shri N.M. Desai,
Chairman,
Larsen & Toubro Limited,
L & T House, Ballard Estate,
BOMBAY-400 038.

Shri P. Bhatia,
General Manager (Projects),
Bhilai Steel Plant,
BHILAI (M.P).

Shri Ajit Singh,
Director,
M.S.R. Foundation,
131, Kandivali Industrial Estate,
Kandivali, BOMBAY-400 067.

Two Members Representing
Workers' Organisation

Shri Bindeshwari Dubey,
President, INTUC Bihar Branch,
C/o. Bokaro Steel Workers
Union,
Sector III, Quarter No. 247,
P.O. Bokaro Steel City,
DHANBAD (Bihar).

Shri Ram Sen,
General Secretary,
Federation of Metal &
Engineering Unions,
11/5, Abdul 2nd Bye Lane,
P.O. Botanical Garden,
HOWRAH-3.

Two Members representing
other interests such as
Engineering Professions
etc. nominated by the
Central Government

Prof. T. R. Anantharaman,
Director,
Institute of Technology,
Banaras Hindu University,
VARANASI-221 005.

Two Coopted Members
representing Industrial
Engineering, Productivity
Science, etc.

Prof. Sukumar Dutta,
Professor of Mechanical Engg.,
Jadavpur University,
CALCUTTA-700 032.

Shri S.S. Rangnekar,
31, Neelamber,
37, Peddar Road,
BOMBAY-400 026.

Prof. A.K. De,
Chairman,
Atomic Energy Regulatory Board,
Chhatrapati Shivaji Maharaj
Marg,
BOMBAY-400 039.

One representative of
Govt. of Maharashtra

Shri John Innocent, IAS,
Secretary to Govt. of
Maharashtra,
Labour, Employment & Technical
Education,
6th Floor, Mantralaya,
BOMBAY-400 032.

Two Members of NITIE
Teaching Faculty to be
Co-opted by the Chairman

Prof. V.K. Gopalan,
NITIE,
BOMBAY-400 087.

Prof. L.M. Sukhatankar
NITIE,
BOMBAY-400 087.

Director, NITIE, Dr. S. Ramani Ex-Officio-Member
Registrar, NITIE, Shri S.L. Chaudhry Ex-Officio-Secretary

About NITIE

NITIE was established as a National Institute in 1963 by the Government of India with the assistance of the United Nations Development Programme through the International Labour Organisation for training executives in Industrial Engineering techniques, methodologies and practices. NITIE is administered through a Board of Governors representing nominees of the Central Government, National Productivity Council, All India Council of Technical Education, Industry and Workers Organisations, Institutes of Technical and Professional importance with Shri B.M. Gogte as the Chairman.

NITIE offers 1½ year Post-Graduate Programme, Post-Graduate Programme by Research, Fellowship Programme at Doctoral level in Industrial Engineering and has been conducting several short-term Executive Development Programmes ranging from one to two weeks duration in various areas of Industrial Engineering. NITIE faculty, drawn from various basic disciplines, have diverse experience in business, industry and government in a variety of functional areas in Management and Industrial Engineering, and thus are able to bring to bear academic concepts to practical problems. Practising Industrial Engineers and executives complement the fulltime faculty of NITIE by giving special lectures. NITIE's active association with Industry helps to provide the students with the necessary contacts in regard to arrangements for plant observation tours and practical project work for solving real life problems.

NITIE Campus is located in one of the most picturesque surroundings of Bombay and is flanked by the Powai and Vihar Lakes.

NITIE Faculty

Dr. S. Ramani — Director

Name	Field of Specialisation
Agrawal RK	Industrial Engineering, Project Management, Plant Maintenance.
Biwas PK (A)	Digital Signal Processing and Computer Software.
Biwas PK (B)	Industrial Engineering, Financial Management, Management Accounting.
Blaggan KK Dean (Consultancy Services, sponsored Projects & PGP Placement)	Industrial Engg., Information Systems & Computers, Organisation Design, Job Evaluation & Wage Incentives, Facility Location Optimisation.
Chakraborty S Incharge of Research Programmes	Quality Control, Operations Research, Applied Statistics.
De Amitabha	Ergonomics, Work Physiology.
George C	Industrial Engineering, Project Management.
Ghosh Sadhana (Mrs.)	Applied Statistics, Computer Science.
Gopalan VK Dean (Programme Development EDP/UBP/SEP, etc.)	Marketing, Cost Estimation, Financial Management, Corporate Planning.
Jayasankar V (Dr.)	Industrial Engineering, Industrial Management.
Joshi PL (Dr.)	Financial Management, Business Accounting & Auditing.
Kalra SK (Dr.)	Organisational Behaviour, Achievement Motivation, Management of Human Resources, Management Development and Training, Industrial, Social Psychology, Population Studies.

Kinra Neelam(Miss) (Dr.)	Marketing Management, Marketing Research.
Kochar IPS (Dr.)	Operations Research, Energy & Power Management, Reliability Studies, Computer Systems.
Mathur HB (Dr.)	Personnel Management and Industrial Relations, Training Techniques, Human Relations, Organisation Development, Organisational Behaviour.
Mohanty RP (Dr.)	Industrial Engg. & Operations Research, General Management, Large Scale Systems Optimisation.
Mukhopadhyay SK (Dr.)	Maintenance Management, Production Planning & Control, Production Management.
Muthukrishnan K	Industrial Engineering, Production Control & Materials Management, Management Accounting, Production Planning and Control Systems.
Narang RV	Industrial Engineering, Materials & Production Management, Organisation and Methods.
Narayanan N	Production Planning & Control, Materials Systems, Optimisation Techniques.
Palwankar RC (Miss)	Marketing
Philipose S (Mrs.) (Dr.)	Operations Research, Quality Control, Statistics.
Rao BS	Systems Dynamics (Business Policies), Large-Scale Systems Design (Modelling), Computers (Structured Design, Data Base Management Systems, Data Communications).

Rao US	Corporate Planning, Production Planning & Control, Materials Management.
Rastogi SC	Industrial Engineering, O.R., Computer Aided Optimisation.
Sahu Bhabatosh (Dr.)	Personnel Management & Industrial Relations, Organisation Behaviour, Human Relations, Development & Organisational Studies.
Sayed OB (Dr.)	O.D, Organisational Health and Effectiveness, Quality of Working Life.
Shamanna K (Dr.)	Organisation Behaviour, Management Development.
Sheth Madhuri G (Mrs.)(Dr.)	Organisational Behaviour, Industrial Relations, General Management, Personnel Management.
Srivastava RK	Industrial Engineering, Project Management, Production Management.
Sukhatankar LM	Industrial Engineering, Production Management, Materials Handling, Facilities Planning.
Swamy NVVS	Production Inventory Systems Management, Corporate Planning.
Thomas Mathew (Dr.) Incharge of Academic Programmes	Industrial Engineering, Project Management, General Management, Development Studies, Business Finance, Business Policy.
Unnikrishnan E (Dr.)	Mechanical Engineering, Industrial Engineering & Administration.

Venkataraman T	Production Mgmt. & Facilities Planning, Industrial Engg., Production Planning & Control, Materials Management, Mgmt. Information Systems, Systems Analysis & Design.
Venkateswarlu (Dr.)	Quality Control, Reliability Engineering, Operations Research.
Venkoba Rao TS	Production Management, Communications, Managerial Development.

OFFICERS

REGISTRAR
S.L. Chaudhry

ASSISTANT REGISTRARS

Gurjar S K (<i>Programme</i>)	Karande KR (<i>Academic</i>)
Purohit JN (<i>Accounts</i>)	Rajagopalan P (<i>Administration</i>)
Shetty AP (<i>Audit</i>)	Venugopalan K (<i>Board & Ministry</i>)
MEDICAL OFFICER	SR. LIBRARIAN
Deshmukh SB (Dr.)	Joshi PG (Mrs.)
SYSTEMS DESIGNER	PROGRAMMERS
Raoot AD	Ashok K
INSTITUTE ENGINEER	Mohan Mathew
Kathare RP	Mukhopadhyay AK
	Sindawani Sunita M (Miss)

Facilities

LIBRARY

The Institute Library holds one of the richest collection in the field of Industrial Engineering. The Library has 33,410 Technical Books, 3,500 Bound Volumes and 321 Current Periodicals. Library Collection primarily covers the subject area Industrial Engineering with due weightage to allied subjects like Organisational Behaviour, Personnel Management, Accounting, Auditing etc. Library has also excellent collection in the field of Computer and their applications to Industrial Engineering.

The USER Community of NITIE Library has a facility for recreational Light Reading Books amounting to 6,580 books with classic literary works in English language.

Library has Inter-Library Loan facility with major Libraries like IIT Bombay, University of Bombay, T.I.F.R. etc. on reciprocal basis.

The Library remains open 14 hours a day on an open access system and has Micro-film Reading Facility.

COMPUTER CENTRE

The Computer Centre is equipped with the hard disk based micro-computer system Zenith SC from M/s Zenith Computers Limited. The system is a 16 bit system with interactive/batch processing capabilities and supports FORTRAN, COBOL, BASIC, PASCAL, DBMS and application software under UNIX like Operating system.

The Computer Centre is also equipped with the floppy based mini-computer system NM4 from Computer Automation supporting BASIC and FORTRAN.

In addition to the inhouse computer systems, the computing facility is also made available on EC-1030 at IIT, Bombay and on DEC-SYSTEM-20 at TIFR Bombay.

The Institute also has plans to install a Remote Job Entry System (a mini-computer with local processing capabilities) with the host system at IIT, Bombay.

HOSTEL

The Programme is residential. NITIE provides accommodation in single seated self-contained, furnished room.

MESS

The students of PGP run their own mess on a cooperative basis.

RECREATION

The Institute has a gymkhana with facilities for playing badminton, table tennis and other games. It also has a music & TV room. NITIE club screens feature films every week.

AUDITORIUM

An airconditioned auditorium with a seating capacity of about 200 is available for film shows, evening talks, etc.

TEACHING METHODS

Variety of class room techniques and training methods are used to make learning purposeful and productive. Extensive range of Audio-Visual equipments are used in the lecture sessions. These sessions are followed by discussions.

Case Method is used to inculcate in the students capability to analyse, select problems and to develop analytical thinking and rational approach to problem solving.

Training methods also include Syndicate discussions and workshop sessions. Management games are played to simulate business environment demanding active involvement and participation. Project work carried out in selected industrial units for solving live industrial and business problems serve as-live laboratories for testing the concepts learnt by the students. Programme is thus both knowledge centred and application-oriented.

RESEARCH METHODS

The objective being to promote application based research, NITIE endeavours to provide pragmatic solutions to real life problems in Industrial Engineering and allied areas through its research activities. The methodology adopted for this purpose is to identify major decision problems in various functional areas in industry and business, do the necessary modelling and simulation for arriving at a suitable solution and then go back to the physical problem for interpretation of results and indication. The steps of implementation and follow up are worked out, keeping in mind the various constraints; after the robustness of the solution has been examined from the view point of its application in the specified decision area.

7. FELLOWSHIP PROGRAMME IN INDUSTRIAL ENGINEERING

Industrial Engineering — The Emerging Profession

“Industrial Engineering is concerned with the Design, Improvement and Installation of Integrated systems of men, material and equipment. It draws upon specialised knowledge and skill in the mathematical, physical and social sciences together with the principles and methods of engineering analysis and design to specify, predict and evaluate the results to be obtained from such systems.”

Industrial Engineering as an emerging discipline is devoted to increasing effectiveness of all productive activities in the society. It is a culmination of an evolutionary process of growth of the scientific approach to management, incorporating analytical techniques such as Work Study, Organisation and Methods, Operational Research, Network Analysis, Ergonomics, Value Engineering, Management Information System and Systems Dynamics. Industrial Engineering is concerned with design of man-machine systems to optimise the use of scarce resources. Thus, it plays a pivotal role in the country's drive towards higher standard of living through rapid economic growth.

Industrial Engineering constitutes one of the rapidly developing professional fields with openings in diverse areas. For example practitioners are called upon to :

- * Locate new plants and design their physical layout.
- * Analyse and plan production schedules and inventories.
- * Devise ways to improve the organisational productivity and morale of people at work.
- * Study the feasibility of new projects, new products and modernisation.
- * Study of modern manufacturing technologies and management systems.
- * Analysing the effectiveness of marketing, logistics and other distribution functions.
- * Design organisation structures and management information system.
- * Design and evaluate computerised software systems to meet the requirements of Modern Industry, business and Government.

7.1 Objectives

The fellowship programme is a doctoral level programme in Industrial Engineering with the objective to prepare students for careers in teaching and application research in Industrial Engineering (I.E.)

To keep pace with expanding frontiers of knowledge in I.E., the programme is multidisciplinary in nature and is broad based.

7.2 Admission

Application may be submitted by candidates who meet the following criteria :

1. 1st Class 'Master's Degree or its equivalent in Engineering or Technology or Business Administration' preceded by Bachelor's Degree in Engineering or Technology.

or

2. Outstanding Bachelor's Degree in Engineering or Technology.

Eligible candidates to pursue research as full time research scholars at NITIE will be classified as **DIRECT CANDIDATES**, while those with full-time employment elsewhere will be classified as **External Candidates**. External candidates should have a minimum of two years of work experience after acquiring the prescribed qualification and such candidates have to be sponsored by the employing organisations with an undertaking that arrangements as per the requirements of and to the satisfaction of NITIE, will be made to enable the candidates to pursue the fellowship programme.

7.3 Commencement of the Programme

Admission shall normally be made once a year with the commencement of academic session during June-July.

7.4 Application Procedure

Prescribed application forms may be obtained from :

ASSISTANT REGISTRAR (ACADEMIC)
NITIE, VIHAR LAKE,
BOMBAY-400 087.

Selection will be based on Academic qualification, work experience, written test, Interview & Motivation for Research.

7.5 Fees and Estimated Expenses

Tuition Fee	: Rs.50/-	} These charges are to be paid during the period of Residential requirement.
	per month	
Course Material	: Rs.10	
	per month	
Student Welfare charges	: Rs.3/-	
Replacement charges	: Rs.5/-	
	per month	
Room Rent	: Rs.30/-	
	per month	
Mess charges	: Rs.350/-	
	(approx.)	
	per month	
Examination fee	: Rs.300/-	

7.6 Programme Requirements

1. Minimum Course Credits :

(a) Candidates with prescribed Master's Degree shall complete a minimum of 24 course credits as detailed below :

- (i) one doctoral level course = 4 credits
(Selected from list 2)
 - (ii) one or two seminars = 4 or 8 credits
 - (iii) Post Graduate courses = 16 or 12 credits
(Selected from lists 1 & 2)
- Total = 24 credits

(b) Candidates with prescribed Bachelor's degree will have to earn a minimum of 48 course credits including one doctoral level course, one or two seminars.

(c) Actual courses and seminars will be decided out of lists 1 & 2 in Section 9, by Board of Research, in consultation with candidates' guide. The Board of Research may also recommend additional courses relevant to the individual's research programme.

2. All course credits (specified in 7.6.1) should be earned

within a **maximum** period of 2½ years from the date of registration.

3. Registration of candidates :

Within one month of completion of 8 course credits and prescribed seminar, the candidate should apply for registration.

- 4. Thesis :** A candidate may submit his thesis only after a **minimum** period of 2 years after Registration. However the maximum period allowed for the submission of Thesis is 5 years from the date of admission.

7.7 Residential Requirements

All external candidates are required to spend a minimum of two quarters in the Institute for fulfilling the residential requirements. One quarter at the start of the Programme and the remaining quarter(s) at any time before the submission of the thesis. For this requirement they should get relieved from their normal duties in their respective organisations and be available for full-time work.

7.8 Regulations

The programme is subject to the rules and regulations framed by the Institute from time to time.

7.9 Doctoral Courses

E51 Advanced Topics in Human Factors Engineering

E52 Human Engineering in the Design of Transport and Traffic Systems.

E53 Human Engineering in the Design & Control of the Physical Working Environment.

*E54 Advanced Research Methodology

*E55 Advanced Systems Engineering

E56 Behavioural Parameters in Problem Solving & Decision Making

E57 Advanced Material Systems

* Compulsory Courses.

**8. POST GRADUATE DIPLOMA
IN INDUSTRIAL
ENGINEERING (BY RESEARCH) FOR
EXTERNAL CANDIDATES**

8.1 Objectives

The Post Graduate Diploma in Industrial Engineering (By Research) is a master's level programme, newly developed for External candidates. The objective is to provide opportunity for candidates with practical experience for an indepth specialisation in selected areas of Industrial Engineering, and to enhance their capability in the design and operation of man-machine systems.

8.2 Admission requirements

Candidates who want to take up this programme should satisfy the following requirements :

A first class degree or high second class in any branch of Engineering or Technology or equivalent qualifications like Graduateship examination of IIIE, etc.

AND

Four years of relevant working experience in organisations of repute.

Sponsorship is essential for these candidates with an undertaking by sponsoring organisation that the candidate will be given all necessary facilities to pursue the programme successfully.

8.3 Comencement of the Programme

Admission shall normally be made once a year with the commencement of academic session during June-July.

8.4 Application procedure & selection criteria

Prescribed application forms may be obtained from :

ASSISTANT REGISTRAR (ACADEMIC)
NITE, VIHAR LAKE,
BOMBAY-400 087.

Selection will be based on Academic qualification, work experience, written test and Interview.

8.5 Fees and estimated expenses

Tuition Fee	: Rs.50/-	} These charges are to be paid during the period of Residential Requirements
	per month	
Course Material	: Rs.10	
	per month	
Student Welfare charges	: Rs.3/-	
Replacement charges	: Rs.5/-	
	per month	
Room Rent	: Rs.30/-	
	per month	
Mess charges	: Rs.350/-	
	(approx.)	
	per month	
Examination fee	: Rs.300/-	

8.6 Programme requirements

1. Minimum course credits :

Candidates with prescribed qualification will have to earn a minimum of 48 course credits consisting of broadly one course at least from each functional area as decided by the Board of Research, out of lists 1 & 2 in Section 9.

2. All credits required for the programme should be earned normally within a maximum period of one year from the date of admission.

3. Within one month of completion of 8 course credits and prescribed seminar, the candidate should apply for registration.

4. Thesis :

A candidate may submit his thesis only after a minimum period of 1½ year after registration. However, the maximum period allowed for the submission of thesis is five years from the date of admission.

8.7 Residential Requirements

All candidates are required to spend a minimum of 2 quarters in the Institute for fulfilling the residential requirements; one quarter shall be at the start of the programme and the remaining quarter(s) at any time before the submission of the thesis.

For this requirement they should get relieved from the normal duties in their respective organisations and be available for full-time work.

8.8 Regulations

The programme is subject to the rules and regulations framed by the Institute from time to time.

9. LIST OF COURSES

9.1 List 1 — Core Courses

Code No.	Course Title	Credit Units
* 101	Applied Statistics	4
* 102	Applied Operation Research I	3
103	Electronic Data Processing & Computational Lab.	5
* 104	Methods Engineering & Practices	5
105	Ergonomics & Lab.	3
106	Business Accounting and Costing	3
* 107	Systems Philosophy	2
201	Industrial Quality Assurance & Lab.	4
202	Applied Operations Research II	3
203	Marketing Management	3
204	Work measurement & Practices	5
205	Engineering and Managerial Economics	4
206	Materials Management	4
207	Organisational Behaviour	4
301	Management Information Systems (MIS)	5
* 302	Financial Management	3
303	Plant Layout and Material Handling and Practices	3
304	Job Evaluation and Incentives Systems & Practices	3
305	Operations Planning & Control	5
401	Industrial Environment and Business Policy	4
* 402	Personnel Management & Industrial Relations	4
*	<i>Compulsory Courses.</i>	

9.2 List 2

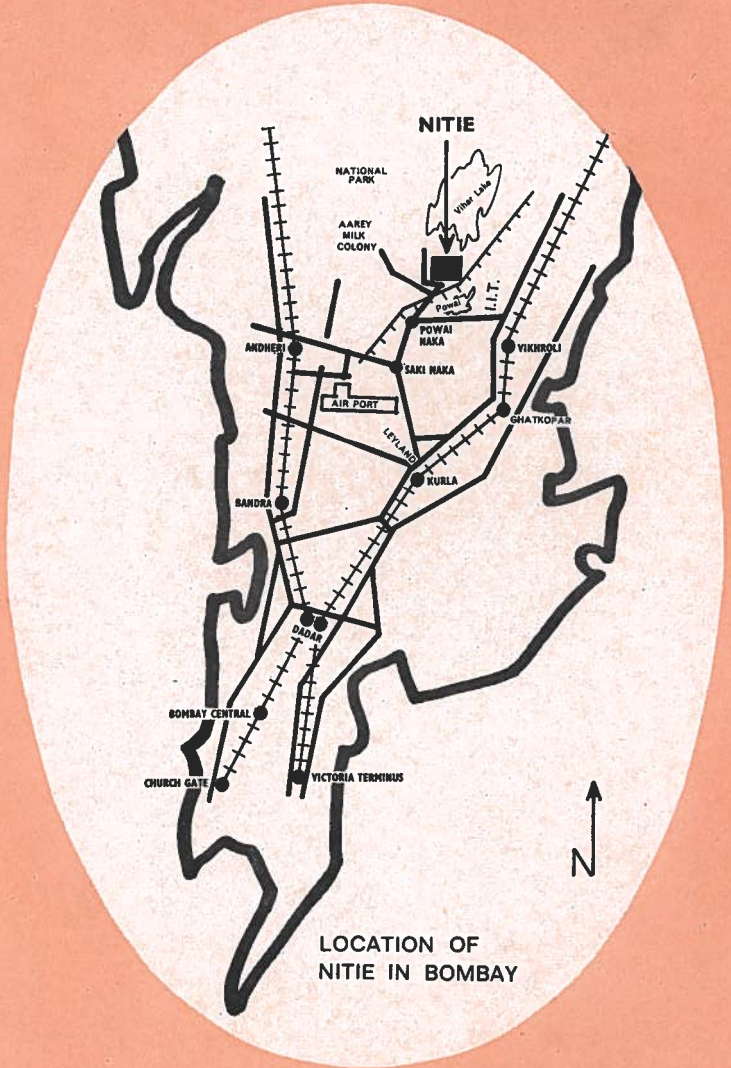
ELECTIVE COURSES

— Each Elective course carries a credit of 4 units.

- E01 Research Methodology
- E02 Project Management
- E03 Corporate Planning
- E04 Advanced Production Management
- E05 Advanced Operations Research
- E06 Simulation & Systems Design
- E07 Software Engineering
- E08 Applied Decision Theory
- E09 Industrial Experimentation
- E10 Econometrics
- E11 Real-Time Systems
- E12 Data Base Management Systems
- E13 System Dynamics
- E14 Systems Engineering
- E15 Energy Management Systems
- E16 Advanced Facilities Planning
- E17 Maintenance Management
- E18 Logistics Management
- E19 Reliability Engineering
- E20 Distributed Data Processing
- E21 Advanced Financial Management
- E22 Environmental Engineering
- E23 Advanced Production Inventory Systems
- E24 Large Scale System Simulation and Optimization
- E25 Psychology for Systems Design
- E26 Advanced Management Practices
- E27 Manufacturing System Design
- E28 Micro Processor Based Systems
- E29 Advanced Marketing Management
- E30 Portfolio Management
- E31 Artificial Intelligence

*Includes some doctoral level courses.



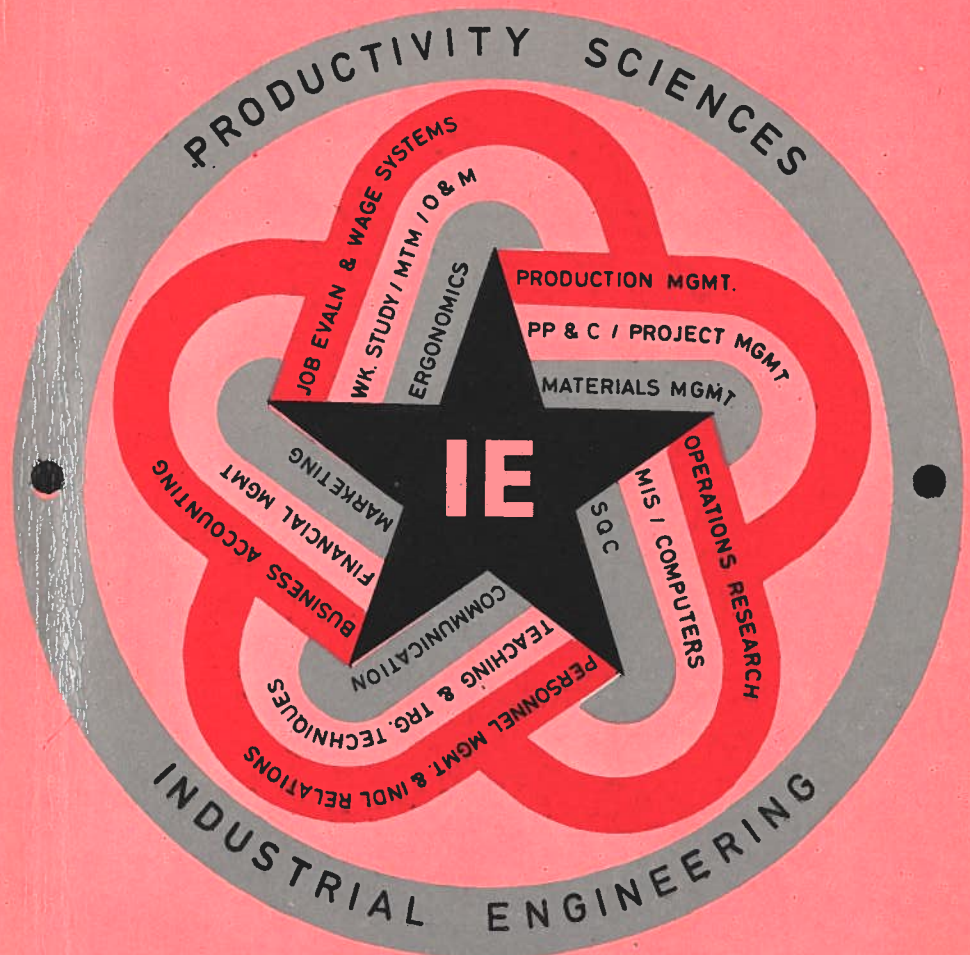


LOCATION OF NITIE IN BOMBAY



POST-GRADUATE PROGRAMME IN INDUSTRIAL ENGINEERING

1985-86



NATIONAL INSTITUTE FOR TRAINING IN INDUSTRIAL ENGINEERING

VIHAR LAKE, BOMBAY-400 087.

GRAM : NITIE, BOMBAY 78

TELEX : (011) 71392

PHONE : 58 33 71



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**FIFTEENTH
POST-GRADUATE PROGRAMME
IN
INDUSTRIAL ENGINEERING**

**PROSPECTUS
1985-86**

**NATIONAL INSTITUTE FOR TRAINING IN
INDUSTRIAL ENGINEERING**

**VIHAR LAKE, BOMBAY 400 087.
(INDIA)**

Telephone : (022) 583371

Telex (011) 71392 NITI IN

Gram : NITIE, Bombay 400 076

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The Institute reserves the right to make changes in the programme, curriculum, syllabus and regulations announced in this prospectus at any time without prior notice.

BOARD OF GOVERNORS, NITIE, BOMBAY-400 087

Chairman	Shri B. M. Gogte, 146, Tilakwadi, BELGAUM-590 006.
Representatives of Central Government Finance	Financial Adviser (Education), Ministry of Education & Culture, Government of India, Room No. 109, 1st Floor, C-Wing, Shastri Bhavan, NEW DELHI-110 001.
Education	Shri M.S. Srinivasan, Jt. Educational Adviser (T), Ministry of Education & Culture, Government of India, Shastri Bhavan, NEW DELHI-110 001.
Ministry of Industrial Development	Shri P.R. Latey, Director General, Tech. Devpt., Directorate General of Technical Development, Udyog Bhavan, Maulana Azad Road, NEW DELHI-110 011.
Representative of National Productivity Council	Dr. A.N. Saxena, Director General National Productivity Council, Productivity House, Lodi Road, NEW DELHI-110 003.
Representative of All India Council of Technical Education	Shri Duleep Singh, Chairman & Managing Director, Rashtriya Chemicals & Fertilizers Ltd., Trombay Plant, BOMBAY-400 074.

Four Representatives of
Industry including Public
Enterprises Nominated by
Central Government

Shri S. Vangala,
Managing Director,
Vijayanagar Steel Ltd.,
Shankaranarayana Bldg.,
25, Mahatma Gandhi Road,
BANGALORE-560 001.

Shri N.M. Desai,
Chairman,
Larsen & Toubro Limited,
L & T House, Ballard Estate,
BOMBAY-400 038.

Shri P. Bhatia,
General Manager (Projects),
Bhilai Steel Plant,
BHILAI (M.P).

Shri Ajit Singh,
Director,
M.S.R. Foundation,
131, Kandivali Industrial Estate,
Kandivali, BOMBAY-400 067.

Two Members Representing
Workers' Organisation

Shri Bindeshwari Dubey,
President, INTUC Bihar Branch,
C/o. Bokaro Steel Workers
Union,
Sector III, Quarter No. 247,
P.O. Bokaro Steel City,
DHANBAD (Bihar).

Shri Ram Sen,
General Secretary,
Federation of Metal &
Engineering Unions,
11/5, Abdul 2nd Bye Lane,
P.O. Botanical Garden,
HOWRAH-3.

Two Members representing
other interests such as
Engineering Professions
etc. nominated by the
Central Government

Prof. T. R. Anantharaman,
Director,
Institute of Technology,
Banaras Hindu University,
VARANASI-221 005.

Two Coopted Members
representing Industrial
Engineering, Productivity
Science, etc.

Prof. Sukumar Dutta,
Professor of Mechanical Engg.,
Jadavpur University,
CALCUTTA-700 032.

Shri S.S. Rangnekar,
31, Neelamber,
37, Peddar Road,
BOMBAY-400 026.

Prof. A.K. De,
Chairman,
Atomic Energy Regulatory Board,
Chhatrapati Shivaji Maharaj
Marg,
BOMBAY-400 039.

One representative of
Govt. of Maharashtra

Shri John Innocent, IAS,
Secretary to Govt. of
Maharashtra,
Labour, Employment & Technical
Education,
6th Floor, Mantralaya,
BOMBAY-400 032.

Two Members of NITIE
Teaching Faculty to be
Co-opted by the Chairman

Prof. V.K. Gopalan,
NITIE,
BOMBAY-400 087.

Prof. L.M. Sukhatankar
NITIE,
BOMBAY-400 087.

Director, NITIE, Dr. S. Ramani Ex-Officio-Member
Registrar, NITIE, Shri S.L. Chaudhry Ex-Officio-Secretary

About NITIE

NITIE was established as a National Institute in 1963 by the Government of India with the assistance of the United Nations Development Programme through the International Labour Organisation for training executives in Industrial Engineering techniques, methodologies and practices. NITIE is administered through a Board of Governors representing nominees of the Central Government, National Productivity Council, All India Council of Technical Education, Industry and Workers Organisations, Institutes of Technical and Professional importance with Shri B.M. Gogte as the Chairman.

NITIE offers 1½ year Post-Graduate Programme in Industrial Engineering and has been conducting several short-term Executive Development Programmes ranging from one to two weeks duration in various areas of Industrial Engineering. NITIE faculty, drawn from various basic disciplines, have diverse experience in business, industry and government in a variety of functional areas in Management and Industrial Engineering, and thus are able to bring to bear academic concepts to practical problems. Practising Industrial Engineers and executives complement the fulltime faculty of NITIE by giving special lectures. NITIE's active association with Industry helps to provide the students with the necessary contacts in regard to arrangements for plant observation tours and practical project work for solving real life problems.

NITIE Campus is located in one of the most picturesque surroundings of Bombay and is flanked by the Powai and Vihar Lakes.

NITIE Faculty

Dr. S. Ramani — Director

Name	Field of Specialisation
Agrawal RK	Industrial Engineering, Project Management, Plant Maintenance.
Biwas PK (A)	Digital Signal Processing and Computer Software.
Biwas PK (B)	Industrial Engineering, Financial Management, Management Accounting.
Blaggan KK Dean (Consultancy Services, sponsored Projects & PGP Placement)	Industrial Engg., Information Systems & Computers, Organisation Design, Job Evaluation & Wage Incentives, Facility Location Optimisation.
Chakraborty S Incharge of Research Programmes	Quality Control, Operations Research, Applied Statistics.
De Amitabha George C	Ergonomics, Work Physiology. Industrial Engineering, Project Management.
Ghosh Sadhana (Mrs.)	Applied Statistics, Computer Science.
Gopalan VK Dean (Programme Development EDP/UBP/SEP, etc.)	Marketing, Cost Estimation, Financial Management, Corporate Planning.
Jayasankar V (Dr.)	Industrial Engineering, Industrial Management.
Joshi PL (Dr.)	Financial Management, Business Accounting & Auditing.
Kalra SK (Dr.)	Organisational Behaviour, Achievement Motivation, Management of Human Resources, Management Development and Training, Industrial, Social Psychology, Population Studies.

Kinra Neelam(Miss) (Dr.)	Marketing Management, Marketing Research.
Kochar IPS (Dr.)	Operations Research, Energy & Power Management, Reliability Studies, Computer Systems.
Mathur HB (Dr.)	Personnel Management and Industrial Relations, Training Techniques, Human Relations, Organisation Development, Organisational Behaviour.
Mohanty RP (Dr.)	Industrial Engg. & Operations Research, General Management, Large Scale Systems Optimisation.
Mukhopadhyay SK (Dr.)	Maintenance Management, Production Planning & Control, Production Management.
Muthukrishnan K	Industrial Engineering, Production Control & Materials Management, Management Accounting, Production Planning and Control Systems.
Narang RV	Industrial Engineering, Materials & Production Management, Organisation and Methods.
Narayanan N	Production Planning & Control, Materials Systems, Optimisation Techniques.
Palwankar RC (Miss)	Marketing
Philipose S (Mrs.) (Dr.)	Operations Research, Quality Control, Statistics.
Rao BS	Systems Dynamics (Business Policies), Large-Scale Systems Design (Modelling), Computers (Structured Design, Data Base Management Systems, Data Communications).

Rao US	Corporate Planning, Production Planning & Control, Materials Management.
Rastogi SC	Industrial Engineering, O.R., Computer Aided Optimisation.
Sahu Bhabatosh (Dr.)	Personnel Management & Industrial Relations, Organisation Behaviour, Human Relations, Development & Organisational Studies.
Sayed OB (Dr.)	O.D, Organisational Health and Effectiveness, Quality of Working Life.
Shamanna K (Dr.)	Organisation Behaviour, Management Development.
Sheth Madhuri G (Mrs.)(Dr.)	Organisational Behaviour, Industrial Relations, General Management, Personnel Management.
Srivastava RK	Industrial Engineering, Project Management, Production Management.
Sukhatankar LM	Industrial Engineering, Production Management, Materials Handling, Facilities Planning.
Swamy NVVS	Production Inventory Systems, Management, Corporate Planning.
Thomas Mathew (Dr.) Incharge of Academic Programmes	Industrial Engineering, Project Management, General Management, Development Studies, Business Finance, Business Policy.
Unnikrishnan E (Dr.)	Mechanical Engineering, Industrial Engineering & Administration.

Venkataraman T

Production Mgmt. & Facilities Planning, Industrial Engg., Production Planning & Control, Materials Management, Mgmt. Information Systems, Systems Analysis & Design.

Venkateswarlu (Dr.)

Quality Control, Reliability Engineering, Operations Research.

Venkoba Rao TS

Production Management, Communications, Managerial Development.

OFFICERS

REGISTRAR

S.L. Chaudhry

ASSISTANT REGISTRARS

Gurjar S K (*Programme*)

Karande KR (*Academic*)

Purohit JN (*Accounts*)

Rajagopalan P (*Administration*)

Shetty AP (*Audit*)

Venugopalan K (*Board & Ministry*)

MEDICAL OFFICER

SR. LIBRARIAN

Deshmukh SB (Dr.)

Joshi PG (Mrs.)

SYSTEMS DESIGNER

PROGRAMMERS

Raoot AD

Ashok K

INSTITUTE ENGINEER

Mohan Mathew

Kathare RP

Mukhopadhyay AK

Sindawani Sunita M (Miss)

Facilities

LIBRARY

The Institute Library holds one of the richest collection in the field of Industrial Engineering. The Library has 33,410 Technical Books, 3,500 Bound Volumes and 321 Current Periodicals. Library Collection primarily covers the subject area Industrial Engineering with due weightage to allied subjects like Organisational Behaviour, Personnel Management, Accounting, Auditing etc. Library has also excellent collection in the field of Computer and their applications to Industrial Engineering.

The USER Community of NITIE Library has a facility for recreational Light Reading Books amounting to 6,580 books with classic literary works in English language.

Library has Inter-Library Loan facility with major Libraries like IIT Bombay, University of Bombay, T.I.F.R. etc. on reciprocal basis.

The Library remains open 14 hours a day on an open access system and has Micro-film Reading Facility.

COMPUTER CENTRE

The Computer Centre is equipped with the hard disk based micro-computer system Zenith SC from M/s Zenith Computers Limited. The system is a 16 bit system with interactive/batch processing capabilities and supports FORTRAN, COBOL, BASIC, PASCAL, DBMS and application software under UNIX like Operating system.

The Computer Centre is also equipped with the floppy based mini-computer system NM4 from Computer Automation supporting BASIC and FORTRAN.

In addition to the inhouse computer systems, the computing facility is also made available on EC-1030 at IIT, Bombay and on DEC-SYSTEM-20 at TIFR Bombay.

The Institute also has plans to install a Remote Job Entry System (a mini-computer with local processing capabilities) with the host system at IIT, Bombay.

HOSTEL	The Programme is residential. NITIE provides accommodation in single seated self-contained, furnished room.
MESS	The students of PGP run their own mess on a cooperative basis.
RECREATION	The Institute has a gymkhana with facilities for playing badminton, table tennis and other games. It also has a music & TV room. NITIE club screens feature films every week.
AUDITORIUM	An airconditioned auditorium with a seating capacity of about 200 is available for film shows, evening talks, etc.

TEACHING METHODS

Variety of class room techniques and training methods are used to make learning purposeful and productive. Extensive range of Audio-Visual equipments are used in the lecture sessions. These sessions are followed by discussions.

Case Method is used to inculcate in the students capability to analyse, select problems and to develop analytical thinking and rational approach to problem solving.

Training methods also include Syndicate discussions and workshop sessions. Management games are played to simulate business environment demanding active involvement and participation. Project work carried out in selected industrial units for solving live industrial and business problems serve as-live laboratories for testing the concepts learnt by the students. Programme is thus both knowledge centred and application-oriented.

General Information

Seats

There are at present 50 seats. Five per cent of the seats are reserved for Scheduled Caste/Tribe candidates. In addition, there are 10 seats provided for industry-sponsored candidates.

Admission Requirement

Admission to the Post-Graduate Programme in Industrial Engineering at NITIE is restricted to graduates of Engineering and Technology of various Indian Universities or equivalent Institutions. Candidates must qualify through Graduate Aptitude Test in Engineering (GATE). The Industry sponsored candidates must have First Class Degree in Engineering (55% in the case of SC/ST candidates).

Financial Aid

Each student, other than sponsored students, admitted to the Programme is paid a Government Scholarship of Rs. 1000/- per month. Sponsored candidates who qualify through GATE at the time of admission are also eligible.

Fees & Estimated Expenses

Tuition fee	Rs. 50/- per month
Course Material	Rs. 10/- per month
Student Welfare	Rs. 3/- per month
Room Rent	Rs. 30/- per month
Mess Charges	Rs. 350/- per month (approx.)

The first instalment of fees is payable on or before the day of admission. The sponsored candidate must deposit in advance the fee for the entire course.

The fees for subsequent months are payable by the students before the 10th of the month. The mess bills will be

presented by the last day of the month and have to be paid by the students every month within 10 days of its presentation.

In addition, the students are required to pay Rs. 1000/- as caution money/mess deposit at the time of admission which will be refunded after the completion of the Programme provided all dues to the Institute have been paid.

The total monthly expenditure may be around Rs. 450/-.

Progress

The Institute reserves the right to ask any student to withdraw from the Programme for poor performance. Evaluation criteria will be distributed to the students on selection.

Students are required to make use of equipments and other property belonging to the Institute with care and without causing any loss or damage. The students found indulging in any activity, individually or in group, resulting in the loss or damage to the property will be required to make good such loss or damage. It would be recovered either directly from those identified persons wherever possible or else collectively from such groups or associations as were found responsible.

PROGRAMME ADMINISTRATION

The Academic Administration of the Post-Graduate Programme in Industrial Engineering is under the charge of the Professor-in-charge Academic Programmes.

The Post-Graduate students will be governed by a set of rules and regulations in force from time to time and which will be supplied to them on admission.

Industrial Engineering — The Emerging Profession

“Industrial Engineering is concerned with the Design, Improvement and Installation of Integrated systems of men, material and equipment. It draws upon specialised knowledge and skill in the mathematical, physical and social sciences together with the principles and methods of engineering analysis and design to specify, predict and evaluate the results to be obtained from such systems.”

Industrial Engineering as an emerging discipline is devoted to increasing effectiveness of all productive activities in the society. It is a culmination of an evolutionary process of growth of the scientific approach to management, incorporating analytical techniques such as Work Study, Organisation and Methods, Operational Research, Network Analysis, Ergonomics, Value Engineering, Management Information System and Systems Dynamics. Industrial Engineering is concerned with design of man-machine systems to optimise the use of scarce resources. Thus, it plays a pivotal role in the country's drive towards higher standard of living through rapid economic growth.

Industrial Engineering constitutes one of the rapidly developing professional fields with openings in diverse areas. For example practitioners are called upon to :

- * Locate new plants and design their physical layout.
- * Analyse and plan production schedules and inventories.
- * Devise ways to improve the organisational productivity and morale of people at work.
- * Study the feasibility of new projects, new products and modernisation.
- * Study of modern manufacturing technologies and management systems.
- * Analysing the effectiveness of marketing, logistics and other distribution functions.
- * Design organisation structures and management information system.
- * Design and evaluate computerised software systems to meet the requirements of Modern Industry, business and Government.

Post-Graduate Programme Objectives

NITIE recognises the growing need for qualified and trained Industrial Engineers who can apply Industrial Engineering techniques to increase productivity and improve effectiveness of organisational systems in all sectors of the economy. The constant and growing demand from Industries for a long term programme in Industrial Engineering has prompted NITIE to offer a Post-graduate programme in Industrial Engineering since July 1971. The programme aims at providing the student with a realistic view of the kinds of problems that they will face during their career as Industrial Engineers and Managers. The programme takes cognizance of the emerging patterns of Industrial Engineering education, the growth of technology, the changing needs of organisations and the development of new areas.

The objectives of the programme are :

- to train students in the design of man-machine systems,
- to develop an understanding of the fundamentals of design, operations and evaluation of organisational systems within the framework of management sciences,
- to train the students in the methodology available to the industrial engineering profession,
- to inculcate a systematic approach for dealing with problems in industry.

The curriculum of the post-graduate programme is so designed that the successful graduates of this course would be well equipped for employment as Industrial Engineers, Production Controllers, Computers system Specialists and Management Service Personnel, etc.

All our previous students (1973-1985) have been very well received by industries, business and Government and are occupying distinguished positions in India & abroad.

NITIE awards Post Graduate Diploma in Industrial Engineering, recognised by the Govt. of India as on par with the Master's Degree in Industrial Engineering after successful completion of 1½ year curriculum.

Calendar

SCHEDULE OF QUARTERS FOR XV PG PROGRAMME STARTING — 1985

Make up courses (2 weeks)	Begins	July 1, 1985	(Monday)
	Ends	July 12, 1985	(Friday)
1st Quarter (13 weeks)	Begins	July 15, 1985	(Monday)
	Ends	Oct. 4, 1985	(Friday)
	Exams	Oct. 7, to Oct. 11, 1985	
2nd Quarter (13 weeks)	Begins	Oct. 14, 1985	(Monday)
	Ends	Jan. 3, 1986	(Friday)
	Exams	Jan. 6 to Jan. 10, 1986	
3rd Quarter (13 weeks)	Begins	Jan. 13, 1986	(Monday)
	Ends	Apr. 4, 1986	(Friday)
	Exams	Apr. 7 to Apr. 11, 1986	
Summer-work-Cum-Vacation (7 weeks)	Begins	Apr. 14, 1986	(Monday)
	Ends	May 30, 1986	(Friday)
(Includes 4 weeks summer work, 2 weeks vacation and one week summer paper presentation. However vacation will be flexible).			
4th Quarter (13 Weeks)	Begins	June 2, 1986	(Monday)
	Ends	Aug. 22, 1986	(Friday)
	Exams	Aug. 25 to Aug. 29, 1986	
Project Work (4 months)	Begins	Sept. 1, 1986	
	Ends	Dec. 31, 1986	

**CORE COURSES TO BE OFFERED FOR XV PG
PROGRAMME STARTING — 1985**

Quarter	Code No.	Course	Unit
I	101	Applied Statistics	4
	102	Applied OR I	3
	103	Electronic Data Processing	4
	* 103 B	Computational Lab.	1
	104 A	Methods Engineering	4
	* 104 B	Methods Engineering Practices	1
	105 A	Ergnomics	2
	* 105 B	Ergnomics Lab	1
	106	Business Accounting and Costing	3
	107	Systems Philosophy	2
TOTAL			25
II	201 A	Industrial Quality Assurance	3
	* 201 B	Industrial Quality Assurance Lab	1
	202	Applied OR II	3
	203	Marketing Management	3
	204 A	Work Measurement	3
	* 204 B	Work Measurement Practices	2
	205	Engineering and Managerial Economics	4
	206	Materials Management	4
	207	Organisational Behaviour	4
TOTAL			27
III	301	Management Information Systems (MIS)	5
	302	Financial Management	3
	303 A	Plant Layout and Material Handling	2
	* 303 B	Plant Layout and Material Handling Practices	1
	304 A	Job Evaluation and Incentive Systems	2
	* 304 B	Job Evaluation and Incentive Systems Practices	1
	305	Operations Planning and Control	5

		2 Electives — I & II	8
306		Simulation Lab.	1
TOTAL			28
IV	401	Industrial Environment and Business Policy	4
	402	Personnel Management & Industrial Relations	4
		4 Electives — III to VI	16
	TOTAL		
Total credits for the above courses			104
Seminar Paper			4
Final Project			20
TOTAL			128

1 Unit of Lab. credit = 2 contact hours per week
All other courses will have one unit of credit = 1 contact hour per week.

* Laboratory/Practice/Field Work.

ELECTIVE COURSES

- Each Elective course carries a credit of 4 units.
- A student may select any six of the elective courses.

E01 Research Methodology
E02 Project Management
E03 Corporate Planning
E04 Advanced Production Management
E05 Advanced Operations Research
E06 Simulation & Systems Design
E07 Software Engineering
E08 Applied Decision Theory
E09 Industrial Experimentation
E10 Econometrics
E11 Real-Time Systems
E12 Data Base Management Systems
E13 System Dynamics
E14 Systems Engineering
E15 Energy Management Systems
E16 Advanced Facilities Planning
E17 Maintenance Management
E18 Logistics Management
E19 Reliability Engineering
E20 Distributed Data Processing
E21 Advanced Financial Management
E22 Environmental Engineering
E23 Advanced Production Inventory Systems
E24 Large Scale System Simulation and Optimization
E25 Psychology for Systems Design
E26 Advanced Management Practices
E27 Manufacturing System Design
E28 Micro Processor Based Systems
E29 Advanced Marketing Management
E30 Portfolio Management
E31 Artificial Intelligence

DOCTORAL COURSES

E51 Advanced Topics in Human Factors Engineering
E52 Human Engineering in the Design of Transport and Traffic Systems
E53 Human Engineering in the Design & Control of the Physical Working Environment
E54 Advanced Research Methodology
E55 Advanced Systems Engineering
E56 Behavioural Parameters in Problem Solving & Decision Making
E57 Advanced Material Systems

Curriculum

The PG Curriculum is structured in two levels :

1. Core Courses
and
2. Elective Courses

The core courses in the different functional areas will be covered in four quarters.

The Elective Courses in the areas such as Operations Research, Systems Science, Production Management and Application of I.E. Techniques to emerging new functional areas will be offered such that the student acquires some degree of specialisation.

The list of Electives will change depending upon the student's preference as also availability of the faculty.

Programme Syllabus

CORE COURSES

101. APPLIED STATISTICS (4)

Probability Distributions, Sampling Distributions, Sampling Techniques, Monte Carlo Simulation, Theory of Estimation, Testing of hypothesis, Analysis of variance, Design of experiments, Correlation and regression, Multivariate analysis.

Text Books :

1. *Bowker A.H. and Liberman G.J. : Engineering Statistics (Prentice Hall Inc.)*
2. *Bhattacharya G.K. and Johnson R.A. : Statistical Concepts and Methods (John Wiley and Sons)*

102. APPLIED OPERATIONS RESEARCH — I (3)

Formulations of Problems as LP, Review of Simplex Method, Duality and Post-optimality Analysis & their applications, Using a computer

program for LP Solution, Parametric and Integer Programming and their applications, Zero-one Programming, Transportation and Assignment Model, Generalized Transportation Model and its applications, Game Problems as LP Problems, Queueing Theory.

Text Books :

1. Hillier F.S. and Liberman G.J. : Introduction to Operations Research, (Holden Day Inc.)
2. Taha H.A. : Operations Research (McMillan Publishing Company)

103A. ELECTRONIC DATA PROCESSING (4)

Review of Basics of EDP systems and peripherals :

Computer System Elements, Computer Generations, Card Readers, Printers Terminal Devices, Special Devices like OCR, MICR, COM and CIM.

Magnetic Tape and Disc : Tape Drive Units, Data Organisation on Tapes, Disc Drives, Disc Addressing, Reading & Writing on Discs.

File Organisation : Sequential records, Bit-pattern index, inverted file, Multilist organization, Index Sequential, Linked queues.

Software : Principles of operating systems, Multi-programming, Applications Software, Flow Charts, Structured Programming, Overview of High Level Programming Languages, APL, BASIC, COBOL, FORTRAN, Pascal, PL/1, RPG, Ada.

COBOL structure with reference to business examples.

Pascal : Introduction; Constant and Variable data declaration, Standard data types.

Problem solving in general; Control statements in Pascal; Syntax diagrams; BNF grammar; Function and Procedures; Recursion, Iteration, Examples; Program development; structured data types, file structures, dynamic data structures; Additional Features of Pascal.

Text Books :

1. Verzello R.J. and Relltter J : Data Processing; Systems and concepts (McGraw-Hill)
2. Davis G.B. : Computer Data Processing (McGraw-Hill)

103B. COMPUTATIONAL LAB (1)

104A. METHODS ENGINEERING (4)

Significance of interdisciplinary approach to Work Study; General approach to problem solving; Methods Analysis and developing better methods; Micromotion Studies; Use of fundamental hand motions; principles of motion economy and work place layout; Cycle graph and chronocycligraph; Process Planning and design of Jigs & Fixtures; O & M fundamentals; Application of method studies in office and other diverse functional areas for development and implementation of work systems.

Value Engineering principles; product maturity cycle, DARSIRI Method; Function Cost and decision-making; Value Analysis; Organising Value Engineering Programme.

Text Books :

1. Krick : Methods Engineering (Wiley Int 1962)
2. Mundel : Motion and Time Study, 5th Edition (Prentice Hall India 1981)
3. Miles : Techniques of Value Analysis & Engineering McGraw Hill

104B. METHOD ENGINEERING PRACTICES (1)

Laboratory Exercises and Field Projects in the Application of Methods Engineering, O & M and Value Engineering.

105A. ERGONOMICS (2)

Introduction to Ergonomics and Human Factor Engineering; Physical basis of man's perception of his environment; Anthropometry & Work Design; Measurement of Work and Work Capacity; Studies on Human Psychosensorial processes for Design of Work Systems. Uses of Ergonomics in developing time standards, Fundamentals of Occupational Health & Safety.

Text Books :

1. McCormick : Human Factors in Engineering and Design (McGraw Hill)
2. Grandjean : Fitting the Task to The Man (Taylor & Francis)

105B. ERGONOMICS LAB (1)

106 BUSINESS ACCOUNTING AND COSTING (3)

Double entry book-keeping, Preparation of ledger accounts, Trial balance, Profit and Loss Account and Balance Sheet, Income and Expenditure Account, Analysis and Interpretation of Final Accounts. Cost Accounting, Fixed and Variable Costs, Process Costs, Standard Costs, Mathematical techniques for Cost Estimation and Cost Control.

Text Books :

1. *Batliboi J.R.* : Double Entry Book-Keeping
2. *Wheldon* : Cost Accounting

107. SYSTEMS PHILOSOPHY (2)

Why Systems Approach : What is Systems Approval.

Systems Concepts : System, environment, I/O, feedback, classification of systems; System Analysis, Systems Design, Systems Engineering, Characteristics of Systems.

General System Theory Concepts : Systems & Engineering flow; (ODUM's flow diagrams) Systems & Material flow (WILD's Material flow diagrams); System & Information flow (flowcharts, systems flow charts etc.)

Problem Solving : Hard & Soft Systems; Soft Systems approach; Root definitions (Customer, Action, Transformation, World View, Ownership, Environment)

System Design : Statement of need; Statement of Available Resources; Statement of Need Satisfaction; Statement of Utilization of Resources; Statement of Trade off Criterion; Statement of Test plan; Examples of application.

Text Books :

1. *Checkland P.* : Systems Thinking, Systems Practices (John-Wiley)
2. *Wymore W* : Systems Engineering Methodology (John-Wiley)
3. *Odum H.T. and Odum E.C.* : Energy Basis for Man and Nature (McGraw-Hill)

201A INDUSTRIAL QUALITY ASSURANCE (3)

Basic concepts of Quality Assurance System; SQC, Control Charts for Process Control, Acceptance Sampling, Concepts & Plans;

Sampling Tables; Product & System Reliability Measurement, Prediction, Evaluation & Optimisation; Fault-tree Analysis; Maintainability; Total Quality Control — Case Exercises.

Text Books :

1. *Grant E.L. and Leavenworth R.S.* : Statistical Quality Control (McGraw-Hill)
2. *Juran J.M. and Gryna F.M.* : Quality Planning and analysis from Product Development through Usage, 2nd Edition (McGraw-Hill) :

201B INDUSTRIAL QUALITY ASSURANCE LAB (1)

Laboratory exercises and practice sessions.

202 APPLIED OPERATIONS RESEARCH — II (3)

Non-linear Programming Examples; Kuhn — Tucker Conditions; Gradient Methods; Quadratic Programming and applications; Dynamic Programming and applications; Network Flows; Markov Chains; Decision Trees; Search Methods.

Text Books :

1. *Beightler C.S., Phillips D.T. and Wilde D.T.* : Foundations of Optimisation (Prentice — Hall).
2. *McMillan Claude Jr.* : Mathematical Programming (Wiley series)

203 MARKETING MANAGEMENT (3)

The nature and purpose of marketing; its role in national economy. The modern concept of marketing; interface between marketing and other functions.

Demand Forecasting & Planning

The marketing analysis and strategy. The marketing mix and the marketing plan.

Market segmentation and the Buyer Behaviour Analysis and Decision Making Process.

Product Decisions. The nature of product, management of new product, product-testing, policies regarding additions, elimination, diversification.

Pricing decisions-nature, bases and policies; integration of pricing decisions with marketing programme.

Channels of distribution. Nature of distribution decisions, channel design and management.

Promotion decisions. Marketing Communication Mix and the role of different elements.

Advertising, nature, process, building a campaign, its evaluation and control.

Personnel Selling, Prospecting, Planned selling, Management of Sales and Organisation-Selection, Training, Compensation, Building of Sales territories.

Legal & Social aspects of marketing.

Text Books :

1. Philip Kotler : Marketing Management
2. Cundiff-Still-Govoni (Prentice Hall) : Fundamentals of Marketing

204A WORK MEASUREMENT (3)

Work Measurement objectives and techniques; Time study & Rating Systems; Allowances; Standard and Allowed Time; Production Norms; Production Study; Activity Sampling; Development of Synthetic and Standard Data; Application of Work Study in non-traditional areas like Hospitals, Public Utilities, etc.

Principles of Predetermined Motion Time Systems (PMTS): The Gilbreth Basic Elements; Basic Motion Time, Work Factor, DMT, etc; the MTM System, its History & Development; Basic Motions and their Control Characteristics; Simultaneous & Combined Motions; limiting motions; Learning Curve concepts; Applications of PMTS & MTM.

Text Books :

1. Karger & Bayha : Engineered Work Measurement (Industrial Press Inc.)
2. Barnes : Motion and Time Study (John Wiley)

204B WORK MEASUREMENT PRACTICES (2)

Laboratory Exercises and field projects in the application of Time Study, Activity Sampling & PMTS.

205 ENGINEERING & MANAGERIAL ECONOMICS (4)

The Principles and use of economic analysis in engineering practice; Discounted cash-flow analysis; Corporate tax; Depreciation & Economic Studies; Replacement Analysis; Valuation of Assets; Economic Study for Projects; Analysis of Risk & Uncertainty.

Elements of Demand Analysis & Forecasting; Theory of firm as an owner and a producer; Market Models, Production Functions; Output and Pricing Decision; Long Run & Short Run Cost Curves; Economies of Scale.

Text Books :

1. Theusen & Fabricky & Theusen : Engineering Energy
2. Bussey : Economic Analysis of Industrial Projects

206. MATERIALS MANAGEMENT (4)

Objectives of materials management, the materials cycle, organisation for materials management.

Materials forecasting and planning, selective inventory control, fixed order size and fixed order interval systems — deterministic/probabilistic models, static inventory models, spare parts management, material requirements planning, aggregate inventory management, implementation aspects of inventory systems.

Standardisation, variety reduction, codification, stores design, stores layout, storage systems and equipment, stores preservation, stores procedures, mechanisation and automation of warehouses.

Purchasing function, purchasing policies and procedures, legal aspects of purchasing, tax considerations in purchasing, selection of sources of supply, make/buy decisions, vendor evaluation and rating, vendor development, price-cost analysis and negotiation, forward buying, speculation and commodity markets, capital equipment buying, imports and customs clearance, purchasing research.

Material accounting and budgeting, evaluation of materials management performance, information systems and computers in materials management.

Text Books :

1. *J.H. Westing, I.V. Fine & C.J. Zenz; (John Wiley & Sons - 1976) : Purchasing Management*
2. *H.K. Compton — (Business Books Ltd. - 1970) : Store house & Stockyard Management*
3. *Starr & Miller : Inventory Control.*

207. ORGANISATIONAL BEHAVIOUR (4)

Organisational Behaviour : A social systems approach; Human Behaviour — Perception, Learning and Motivation Theories of Personality, Formation of Attitudes, Process of Communication.

Group dynamics, factors affecting group performance, Informal groups, leadership, styles of leadership and their effect on performance, Resolving conflicts.

Management of change, systems approaches to change; Organisational Structure & Design, Organisational Development, Management by Objectives.

The role of industrial engineer as change agent, research studies and case studies in organisational behaviour.

Text Books :

1. *Luthans, Fred : Organisational Behaviour, McGraw Hill*
2. *Parek, U. Rao, T.V., Pestonjee, D.M. : Behavioural Process in Organisation, Oxford IBH, 1981.*

301. MANAGEMENT INFORMATION SYSTEMS (5)

System Analysis : need for systems analysis, role of system analyst in data processing, system analysts and user departments.

Objectives of the system; immediate and long term; Top management support and involvement, assignment brief. Systems Investigation : Fact Finding, Identifying areas for system study, inspection of documents, detection of exceptions, interviewing staff, organisation and utilisation, costing the existing system.

Analysis of Basic Data : Classification of items, coding of entities, Feasibility checking; Check digits, interpretation of facts and procedures.

System Design Consideration : Computer as a service to organisation; Interrelationship of files; Integrated data processing, distributed processing, System's definition and documentation. Design of Data processing System : Stages of system design, output definitions, input definitions, Data element dictionary; Decision Table and System Flowcharts; Case studies.

MIS & DBMS : Characteristics of MIS requirements; Information System Design — overall and detail. Database technology, relevance of data base for computerized MIS; DBMS (hierarchical, network, relational); Data Security Methods, MIS implementation and maintenance;

Case studies from various functional management areas.

Text Books :

1. *Leon Youssef : Systems Analysis and Design (Reston Publishing Company)*
2. *Burch John G., Jr. and others : Information Systems : Theory and Practice (John Wiley and Sons)*

302. FINANCIAL MANAGEMENT (3)

Management Accounting, Profitability Assessment, Management Audit, Evaluation and Control.

Corporation finance, sources of funds. Types of capital dividend policy. Working capital management and budgeting. Budgetary control system, Sales budgeting, production budgeting. Performance budgeting.

Text Books :

1. *U.S. Murthy (Vakils Fefers & Simons Ltd) : Management Finance*
2. *James C. Vanhorne : Financial Management & Policy*
3. *I.M. Pandey (Vikas Publications) : Financial Management*

303A. PLANT LAYOUT & MATERIALS HANDLING (2)

Plant Locations — theory, practice and evaluation; Layout models and techniques; systematic layout planning — factory and offices;

Production Line balancing; Computerised Layout Planning. Systems of Materials Handling Equipment; Systematic Handling Analysis; Storage & Warehouse Planning; Integration of Layout with handling.

303B PLANT LAYOUT & MATERIALS HANDLING PRACTICES (1)

Laboratory Exercises, and Field Projects.

304A. JOB EVALUATION & INCENTIVE SYSTEMS (2)

Job-Evaluation-behavioural aspects of employees compensation and concept of equity; job evaluation and its role in modern wage and salary administration; preparation and uses of job position descriptions; various methods of job evaluation; systematic methodology of designing developing and implementing job evaluation systems; job pricing, wage and salary surveys; rationalising and developing improved structures of pay, role of trade unions.

Wage Incentives-money, motivation and need for linking wages with productivity; intrinsic satisfaction and extrinsic rewards; individual and group incentives; types, design, structure and implementation of incentive wage systems; plant wide schemes; Scanlon Plan and other productivity gains sharing schemes; experience in India and abroad.

Text Books :

1. *Belcher* : Compensation Administration, (Prentice Hall)
2. *Louden & Deegan* : Wage Incentives (John Wiley)

304B JOB EVALUATION & INCENTIVE SYSTEMS PRACTICES (1)

Field Projects/Observations and case studies.

305. OPERATIONS PLANNING AND CONTROL (5)

Concepts of PPC for various types of production systems; integrated planning and control systems for production and physical distribution.

Demand Forecasting, Aggregate Planning and Master Scheduling; Aggregate Planning and Master Scheduling Models.

Planning and Scheduling for High Volume/Standardised Operations; Advanced Concepts in Flow-line Design.

Planning and Scheduling for intermittent systems, criteria for effectiveness scheduling for flow-shop, Scheduling Decision Rules, Use of Computers in PPC.

Group Technology and Cell System of Production, PERT/GERT. Line of Balance Technique, Project Monitoring.

Maintenance Systems; Maintenance Planning and Control; Planned Maintenance Systems.

Operations Performance Evaluation and Reporting; Design and Implementation of PPC Systems.

Text Books :

1. *Buffa & Miller, Richard D. (Irwin Inc 1979)* : Production — Inventory Systems : Planning & Control
2. *K.R. Baker, (Wiley 1974)* : Introduction to Sequencing and Scheduling

306. SIMULATION LAB (1)

401. INDUSTRIAL ENVIRONMENT & BUSINESS POLICY (4)

Indian Economic Planning and Development Framework, Regulations and Controls; Indian Industry — Productivity Scenario and Bottlenecks; Resource Endowment; Technology, and Research and Development Environment. Socio-Economic Environment; Employment, wages and prices; International Trade and Balance of payments, Institutional Financing; Character of modern business and organisations; Corporate strategies; Study of policy as an integrative approach.

Text Books :

1. *Debesh Bhattacharya (The World Press Pvt. Ltd.)* : The Role of Technological Progress in Indian Economic Development.
2. *Alok Ghosh (World Press Pvt. Ltd.)* : Indian Economy
T.A. Smith (McGraw Hill Book Company) : Dynamic Business Strategy

402. PERSONNEL MANAGEMENT & INDUSTRIAL RELATIONS (4)

Personnel Function :— Its evolution, objectives, principles, philosophies and policies, duties and responsibilities of the Personnel Manager; position of the Personnel Department in the Organisation; Line & Staff Relationship and the changing concept of Personnel Management in India.

Manpower Planning :— Its uses and benefits; Problems and limitations; manpower inventory; manpower forecasting, job descriptions; manpower skills analysis and practices in the Indian industry.

Recruitment : — Job specification, selection process, psychological testing; interviewing techniques, transfers, promotion and its policies; induction, placement and exit interview.

Training & Development : Its objectives and policies, planning and organising the Training Department; Training Manager and his job; on and off the job training, training techniques, career planning; objectives of performance appraisal and its methods.

Industrial Relations : Problems of Labour Management Relations, Causes for Poor Industrial Relations; conditions of good Industrial Relations; Trade Union Act; Objectives and advantages of Trade Unions; Collective Bargaining; Industrial Disputes Act; Disciplinary Action and Domestic Enquiries, Machinery for Settlement of Disputes; Grievance Procedure and its handling; Counselling; Lay-Off; Lockouts, Strikes, Retrenchment; Labour Participation in Management; Joint Management Councils, Factories Act and other Social Security Acts relevant to the course.

Text Books :

1. *Monappa Arun and Saiyadain M.S. (Tata McGraw Hill) : Personnel Management.*
2. *Malik P.L. (Eastern Book Co.) : The Industrial Law*
3. *Management of Human Resources, 2nd Edn. (1979) Himalaya Publishing House, Bombay : Dynamic Personnel Administration.*

PROJECT/THESIS

Towards the partial fulfilment of the requirement of the Post-Graduate Diploma in Industrial Engineering the students are re-

quired to undertake four months project work on real life problems in industrial and business organisations. This provides them with an opportunity to apply industrial engineering concepts and techniques for solving real life problems and equips them with acumen of handling such problems more effectively in job situations. For the project/thesis work each student will be under the guidance of a faculty adviser. He will be required to submit a comprehensive report of the assignment and defend the same before an examining body.

The scope of project/thesis work is outlined as below :

PROJECT

The project should demonstrate the capability of the student to analyse, synthesise and design a system. The design of such system may be for planning optimization and control of industrial and business operations/integrated economic design of plant/design of integrated production and distribution systems/design of management information control system/design of man-power planning systems and/or a combination of any of the above.

OR

THESIS

The student will be required to submit a thesis on a research-oriented topic. The dissertation should investigate the application of available theoretical concepts/models to any work situation leading to reinterpretation of established facts/new facts.

ELECTIVE COURSES

E 01 RESEARCH METHODOLOGY

Nature of research process, Basic Vs Applied research, Formulation of the research question, definition of a problem, and statement of hypothesis, hypothesis testing.

Research methodology, Investigation Vs Analysis and testing, Case studies of selected research projects.

Research design, Analysis of variance, non-parametric tests and their application for the interpretation and analysis of data.

Text Books :

1. Wallizer MH and Wienir PL : Research Methods and Analysis; Searing for Relationships
2. Dominowski Roger L : Research Methods, 1980.

E 02 PROJECT MANAGEMENT

Project Identification and Development in Industry, Economic Development Projects.

Project Ideas and Innovation — Planning and Implementation of R & D Projects;

Resource Surveys; Needs Analysis-, Market Research, Market Planning;

Analysis of Infrastructure, Elements of Economic Geography, Location, Manpower, Inputs, Transport , Site Selection;

Industrial Policy, Government Incentives and Regulations

Techno-economic Analysis choice of Technology, Choice of Process, Appropriate Technology

Technical feasibility, Technology Assessment. Technology Transfer.

Cost-Benefit Analysis, Financial Analysis, Economic Analysis,

Social-Cost Benefit Analysis, UNIDO, WORLD BANK and OECD Methodologies;

Cost Estimating; Project Financing, Sources of Finance, Cost of Capital, Capital structure, International Finance & Foreign

Exchange Regulations; Projects and Contracts Planning and Co-ordination, Project Scheduling and Monitoring Tools and Techniques, Project Management Information Systems and Documentation.

Text Books :

1. United Nations Industrial Development Organisation (Oxford & IBH Publishing Co.) : Project Formulation & Evaluation Series No. 1., No. 2 & No. 3
2. Lynn & Bussey (Prentice Hall) : The Economic Analysis of Industrial Projects
3. Kintz Collier (Reston Publishing Co.) : Managing Construction Contracts

E 03 CORPORATE PLANNING

Corporate objectives, goals and policies; Process of corporate planning; SWOT analysis, Gap analysis, Strategy formulation.

Environmental scanning and analysis; Technological forecasting, Economic and Social environment, Business forecasting, Market dynamics, Government policies, Elements of futurology. Strategies for growth and survival; long range planning of R & D, strategies for technology based industries, Multinational operations.

Investment evaluation, Capital budgeting, Risk analysis Computer modelling.

Organising for Corporate Planning, Implementing Corporate strategies, Business plans, Resources planning, Management Controls and Information Systems.

Text Books :

1. Lorange & Vancil; Prentice Hall : Strategic Planning System
2. J.L. Harvey — A New Garden Wiley : Management guide to mergers and acquisition.

E 04 ADVANCED PRODUCTION MANAGEMENT

Role of Production Management — Meshing of Medium Term Planning and Control with Long Range Planning.

Type of firm — Technological policies of the firm — influence on Production, Marketing and Management Information Systems — Coordination of Sales and Production.

Technological and Market Forecasting — Product Process Strategies — addition, modification and deletion of facilities, processes and Products — Planning for Growth — Evaluation of Production Programmes and setting of targets.

Product Engineering — Design, Development and Engineering for Production — setting Quality standards — Maintainability, Reliability and Assurance considerations.

Plant and Equipment Selection — Evaluation of benefits under Planned loads — Influence on Inventory, Scheduling, Work Force and on other operations in the System.

Automation — Special consideration in evaluating their costs and benefits — use of Computer in manufacturing.

Research and Development — Development of work force — Maintenance procurement and quality consideration — Managerial Controls for Medium Term Plans.

Performance Criteria — Return on Net Assets-Growth Projections and Projection of Management Ratios — Developing budgets and Budgetary Controls.

Text Books :

1. *Schroeder R G — McGraw : Operations Management*
2. *Skinner W — Wiley : Manufacturing in the Corporate Strategy*
3. *P. Falster and Arolstadas : Production Management Systems*

E 05 ADVANCED OPERATIONS RESEARCH

Stochastic Programming; Separable Programming; Fractional Programming; Geometric Programming; Multi-Objective Problems. Decomposition Principle. Mixed Integer Programming; Replacement, Maintenance and Investment Models; Advanced Models in Queues; Special Problems in O.R. Advanced Topics in OR; Cases in O.R.

Text Books :

1. *S.S. Rao, Willey Eastern Ltd. : Optimization Theory and Applications*

E 06 SIMULATION & SYSTEMS DESIGN

Need for system modelling, systems approach to modelling, open and closed loop models, Monte Carlo simulations; generation of stochastic variates, continuous and discrete probability distributions; application of Monte Carlo methods for production system, Computer simulation models; Flow charts, Time representation, operation of simulation models. Macro dynamic models; examples from business and industry, Games and gaming design of management game simulation languages, SIMULA, SIMSCRIPT, GPSS etc.

Text Books :

1. *Jones G.T. : Simulation & Business Decision*
2. *Guaybeal, Wajne J & Pooch U.W. : Simulation Principles & Methods*

E 07 SOFTWARE ENGINEERING

Operating Systems : Role & functions; Process definition, Communication; synchronization primitives, dead locks.

Processor allocation, Memory Management; I/O procedures, file devices; spooling.

File system : Basic file system, logical file system; access methods protection : Domains & capabilities; protection implementation

Job Control : Command Languages; JCLS, job pool, system messages.

Examples of OSS : Micro computer (CP/M), Mini (UNIX) and large OS360/370 systems, time storing OSs.

Structured Design : Developing a program; program design, structured program testing and debugging.

Basics of Structured design, contest diagrams flow charts; Structure Charts.

Structured Specification, Data flow diagram, data dictionaries; Module specification methods, Coupling, Cohesion.

Design strategies : Transform analysis, Transactional analysis.

Packaging of optimization of module & Implementation of modular systems.

Text Books :

1. *Tsichritfis & Bernstein (Academic Press) : Operating System*
2. *Meilirpage Jones (Yourd Press) : Practical Guide to Structured System Design*

E 08 APPLIED DECISION THEORY

Decision making in industry, utility theory and utility functions, decision-making under uncertainty and risk, Quantitative techniques for Decision making; Discriminant Analysis, Cluster analysis; factor analysis, technological forecasting for business decisions, Long-range planning & corporate strategy, different techniques of technological forecasting.

Gaming and game theory, Group decision-making, Arrow paradox, Applications of decision theory in corporate decision-making with Case examples.

Text Books :

1. *William T Marris : Decision Analysis*
2. *V.M. Rao Tummala : Decision Analysis with Business Applications*

E 09 INDUSTRIAL EXPERIMENTATION

Fundamental Concepts of Industrial Experimentation — Incomplete Block Design — Factorial Experiments — Split Plot design — Factorial replication — Principles of confounding — Orthogonal arrays — Response surface methodology — experimental optimisation — Concurrent designs — case exercises.

Text Books :

1. *Davis Owen I (ed) : The Design and Analysis of Industrial Experiments (2nd Edition)*
2. *Montgomery Douglas C : Design and Analysis of Experiments*

E 10 ECONOMETRICS

Types of Economic variables, relationships and models, special problems of measurement in economics, Index numbers & aggregation, estimation of parametres in a single equation model, estimation in simultaneous equation system, Identification problem, Autocorrelation Problem, Heteroscedasticity, Stochastic

Programming Technique, Two State Least Squares Methods. Macro-economic models for policy analysis & forecasting, Econometric analysis of demand, supply & costs, other micro-economic applications of econometrics, econometric analysis for management, corporate planning models, econometric modelling for urban/regional planning and analysis of socio-economic systems.

Text Books :

1. *Johnston : Econometric Method*
2. *Goldberger : Econometric Theory*

E 11 REAL TIME SYSTEMS

Introduction & Management : Real Time Systems, an invoice payment system, real time characteristics, variety in real time systems, Conversations & exchanges.

Stages of Systems Development : Major stages, Preliminary Systems Design, Scheme for Real Time System Design, Work Programme for Logic Design.

Documentation of Outline Systems : Task description, Conversation Identification, Procedure Specifications.

System Design : Conversation Specification, Message Planning Exchange Specification, Data base Specification, Program Identification.

Application of Design Data : Network design, control of Modification, Design approval.

Application Systems Installation : Detailed Logic Definition, Detailed Data Definition, testing stages, Testing Methods.

Conversion & its documentation : System Management, manual conversations in conversions.

Further references : Queueing theory & practice, Data Transmission, Reliability Calculation, File techniques, Designing Real-time.

Text Books :

1. *Blackman Wiley; Interscience : The Design of Real Time Application.*
2. *Tebbs & Collins Mcgraw Hill (U.K.) : Real Time Systems*

E 12 DATA BASE MANAGEMENT SYSTEMS

Basic Concepts of DBMS : Data models (HDB, NDB, RDB) Bubble charts; grouping data into records (3NF); Canonical data Base Design.

Network Principles : record type, sets, set constructs, transitive graphs.

Scheme DDL Mapping of records and sets into storage; currency of set.

Record Identification, Set occurrence selection, seven formats of FIND, DBMS Operation (AP, OS & DBMS interactions).

Design of data base : Logical Access Maps (LAMS) Data Base Action Diagrams (DADS), Structured-English; coding for procedure.

Data model concepts; Scheme (Structure part and constraint part) Abstraction, generalization, Aggregation, sets, extended sets, domains relation, entity relationship, basic models.

Relational model : relational algebra, relational calculus SQL QBE & LAGRIF.

Hierarchical model : tree, occurrences, parent-child structure diagram, bidirectional physical pairing, use of inter section segment, virtual pairing, supplementary segment.

IMS Structure, PDB, DBD, PCD, Secondary indexing, Multiple Secondary indices.

Data Dictionaries; Data Security

Project work relating to Network DBMS & use of DBMS-10 software.

Text Books :

1. *Martin — J. Prentice Hall : Managing the Data Base Environment*
2. *Data (C.J.) — Addison Wesley : An Introduction to Data Base System*

E 13 SYSTEMS DYNAMICS

Introduction to Systems Dynamics : Basic problem, Fundamental System Concepts. Occurrence of dynamic phenomena in managerial & economic Systems. Objectives of a system dynamic Analysis.

System Structure and Behaviour : Principles for formulating dynamic system models, Structure of dynamic system model, System of equation, Symbols for flow diagrams, representation of delays, policies and decision, aggregation of variation. Exogenous variables, judging model validity.

Examples of Dynamic System Model : Model of production distribution system and advertising in to system Model (Forrester's models)

Further examples : System Dynamics in Manufacturing, Dynamics of Marketing and distribution, Research and Development System Dynamics, Managerial Control and Financial Applications.

Application of Systems Dynamics to Societal Problems : Regional Economic Simulation Model for Urban transportation planning, Narcotics and Community, Natural Resources Management and Sociological Systems.

Case Studies : DMC (Export), Design of Integrated Oil supply System and United Metal (Coyle's Models), Corporate Planning models. (LYNEIS Models)

Text Books :

1. *Roberts : Mitpress : Managerial Application of System Dynamics*
2. *COYLE — John Wiley : Management System Dynamics*
3. *Lyneis J.M. (M.I.T. Press) : Corporate Planning & Policy Designs*

E 14 SYSTEMS ENGINEERING

Systems & System Engineering : Inter-disciplinary team, Systems Engineering Methodology, Tricotyledon theory of Systems Design, Systems, Manipulation of Systems.

Input/Output Specifications : Systems Design, Satisfaction of I/O Specifications.

Technology, Implementation & Feasibility : A technology for a systems design problem (example), technology cotyledon, Implementation of subsystems and systems, Feasibility cotyledon.

Merit Orderings : Definitions, merit-orderings over I/O cotyledon, merit orderings over Technology cotyledon, merit ordering over feasibility cotyledon.

System Testing : Setting the stage for systems testing, objectives of testing, testing procedure, Systems Testing Methodology.

Systems Design : Objectives of Systems Design, Trial & Error, development of Systems-Theoretic Models, Systems function Analysis, Systems Engineering Management.

System Design Applications : Models of Retail Sales Operation, an Information Retrieval Systems, Model of River Basin, System Model of an Open pit mine, model of a human Organization.

Text Books :

1. A.W. Wymore, John Wiley & Sons : Systems Engineering Methodology
2. Wymore, John Wiley : A Mathematical Theory of Systems Engineering — Elements

E 15 ENERGY MANAGEMENT SYSTEMS

Energy and economic development : Energy sources as used in Industries; Use of non-conventional energy sources in Industries.

Energy conservation in Industries : Electricity conservation; energy conservation in Boilers and Furnances; Energy conservation in steam flow systems; energy conservation through computer control.

Energy Accounting and Audit System : Design of energy accounting system and its computerisation, Different Auditing systems.

Total Energy of Cogeneration Systems — Their techno-economic feasibility in process industries. Optimal Energy Planning Systems considering Scarcity of sources and requirements of energy.

Energy and Environment : Implication of energy, induced pollution; clear energy technology.

Text Books :

1. NITIE Handout Bank

E 16 ADVANCED FACILITIES PLANNING

Advanced study of topics related to facilities planning and location decision with emphasis on formulation of optimization models and development of solution procedures using computers, O.R. algorithms and heuristics approaches; Weberian Location theory; Con-

tribution of Hoover, Greenhut, and Losch, Isard, and others to Locational dynamics of manufacturing facilities; Linear integer, non-linear, Quadratic and Dynamic Programming and Network flow models-discrete & continuous, to solve Single, and multifacility location; Location-allocation; Plant & Warehouse location and Multiproduct distribution system design problems.

Approaches for solving location decision problems with private or public sector goals; economies of scale; capacity and configuration constraints; and multiperiods will also be dealt with.

Text Books :

1. Handler & Mirchandani, (Mit Press (1979) : Location on Net Works
2. Francis & White Prentice Hall (1974) : Facility Layout & Location

E 17 MAINTENANCE MANAGEMENT

Characteristics, benefits, objectives and policies of maintenance; Organisation and structure of maintenance system; Mechanics of maintenance system; Planning and Scheduling maintenance activities, preventive maintenance, development of preventive maintenance schedule; Planned prevention of breakdowns, equipment codification, and classification, maintenance budgeting and cost control; Production Maintenance integration; replacement policies and models, reliability, maintenance manpower planning, spare parts management, maintenance downtime analysis, computerised maintenance system, application of simulation technique, mathematical models of maintenance, design, implementation and operation of an integrated maintenance system, concept of applied maintainability.

Text Books :

1. A.S. Corder, McGraw Hill Book Company : Maintenance Management
2. Benjamin S., Blanchorrd Jr. & E Edward Library McGraw Hill Book : Maintainability Principles & Practices

E 18 LOGISTIC MANAGEMENT

Structure of the logistic system;

Relation to Industrial Activities; Marketing, Manufacturing, Purchasing, Product Engineering, Financial Management.

Typical Logical Systems; Echelon Systems, Direct Systems, Dual Systems.

Design and Planning of Distribution Channels; Definition of PDM: Distribution Decision areas, Benefits of total distribution; physical distribution as a service to marketing, Total Cost Approach.

Vehicle Scheduling and load planning;

Modes of Transportation.

Derivation of Reliability, maintainability and availability factors in logistic systems.

Optimum repair level analysis including logistics and maintenance policies, logistic support analysis.

Terotechnology and life cycle costing.

Long Range logistics Planning under Uncertainty.

Text Books :

1. *Blanchard, Benjamin S Prentice Hall : Logistics Engineering & Management*
2. *Ballour, Ronald H, Prentice Hall : Basic Business Logistics*

E 19 RELIABILITY ENGINEERING

Introduction to Reliability, Reliability Models, Reliability Evaluation Methods, Product Reliability, Fault-tree Analysis, Reliability Optimisation, State Transition Diagrams for Maintained and Non-Maintained Systems, Reliability as a function of stress and strength, Maintainability and Availability, Life Testing and Reliability Measurement, Application of Reliability in Maintenance Strategies, Cost Effectiveness of Reliability Options in Production Systems, Case Studies.

Text Books :

1. *Shooman, M.L. McGraw-Hill, Inc., : Probabilities Reliability An Engineering Approach*
2. *Green, A.E. and Bougne A.J. Wiley & Sons. Inc. (1972) : Reliability Technology*

E 20 DISTRIBUTED DATA PROCESSING

Distributed Processing Potential; Forms of Distributed Processing strategies DDP, Hexagon diagrams.

Network Structure & Architecture; Type of networks & ISO Seven reference layers.

Network Topology : Back bone Design; Local Access Design

Physical Layer : Channel Characteristics, Modulation techniques, Digital transmission, error corrective codes.

Data Link Layer : Protocols HDLC, DECNET, State Transition, Petri networks.

Network Layer : Point to Point; Virtual circuits, datagrams routing algorithms; satellite & packet radio network, local area network (LAN)

Transport & Session Layers, Application layers; distributed data base system problems, conflict analysis.

Security & Auditability Future of network software.

Text Books :

1. *Tennanbaum (Pentice Hall) : Computer Networks.*
2. *Martin (Prentice Hall) : Design and Strategy for DDP.*

E 21 ADVANCED FINANCIAL MANAGEMENT & MANAGEMENT ACCOUNTING

Financial Objectives : The ROI concept in Financial Planning & Control.

Working Capital Perspective, Planning and Control.

Capital Expenditure Projects : Discounted Cash flow techniques and Sensitivity Analysis.

Concept of Company's cost of capital and Capital Structure Computation Analysis.

Dividends/Retention Policy, Issue of Bonus Shares/Right Shares Amalgamations and Basic Valuation Concepts.

Corporate Taxation and its implication on Corporate Financing.

Variance Analysis, Computation and Control and Managerial Decisions.

Direct Costing, Absorption Costing. Marginal Costing, Advance problems involving their applications and Management decisions.

Integration of Financial Accounting and Cost Accounting records.

Concept of Relevant Cost Analysis and implications on Management decisions and Transfer Pricing.

Budgeting Process : An overview of different functional budgets, Integrated approach to Budgeting & Flexibility budgeting.

Text Books :

1. Anthony Robert N : Management Accounting Text & Cases.
2. Nagaratham S, S Chand & Co. : Management Accounting, Financial Management & Holding Company Accounts.
3. Charles T Horngren : Management Accounting

E 22 ENVIRONMENTAL ENGINEERING

Environmental Properties and Processes, Environmental Dilemmas, Environment and Development Process; Resources, Technology and the Environment : their relationships.

Managerial skills and the Environment, Government and Society : Their roles towards Environment.

The total environmental concepts, Investigation of environmental Problems;

Environmental Planning, Management of Natural Resources, Environmental Impacts.

Environmental modelling; Role and application of Simulation and optimisation; Risk-Benefit analysis; Standard Setting.

Specific application Studies in Management of Ecological Systems, Air Pollution, Water Management, Waste Management.

Text Books :

1. Jack G. Beale., Pergamina Press : The Manager and the Environment.
2. D. Dactz and R.H. Pantell, Dowden, Hutchinson & Ross Inc. : Environmental Modelling.

E 23 ADVANCED PRODUCTION-INVENTORY SYSTEMS

Classification of Production-Inventory Systems. Static Deterministic Continuous Demand Models, incorporating storage costs as func-

tion of Production Costs, Step functions for storage costs. Price-dependent Demand; Discrete Demand, Optimal Policy of Withdrawal of slow moving items. Static Probabilistic models, incorporating set up costs. Optimal Reserve Inventory level between systems, and finite processes models, case studies for spare parts management.

Dynamic Models, Production smoothing Problems, Feedback Control models; Fluctuating market models. Applications to Job-shop industries.

Parallel stations and series station models. Simulation models for Production-Inventory Systems. Application of simulation models for planning and Control of Production — Inventory Systems.

Network models with convex and concave cost functions.

Multi Product Models with Nonlinear Costs.

Computer applications in Production — Inventory Systems Design.

Text Books :

1. Vanttees, Monhemills — Macmillan : Production & Inventory Control : Theory & Practice.
2. Hanssmann — John Wiley : Operations Research in Production Inventory Control

E 24 LARGE SCALE SYSTEMS SIMULATION AND OPTIMISATION

Methodologies for Systems Planning

Normatic components in Systems Planning

Programme Planning Linkages

Structural Modelling : System Identification, Structural Concepts. Delphi, Cross-impact analysis, Applications for Socio-technical systems :

Input-output models — application for Socio-economic Systems.

Dynamic simulation methods, Evaluations of simulation methods, applications for Production-Distribution Systems

Hierarchical Decomposition methods — Application for Production Planning and Control

Combined use of Simulation and Optimisation methods — Case studies.

Multi-objective Decision making methods and their applications to Production Systems.

Heuristic Search and Reasoning in large-scale systems Problems solving.

Text Books :

1. *A.P. Sage, Mcgraw Hill : Methodology for Large-scale systems*
2. *D.W. NK Wismer McGraw Hill : Optimization Methods for Large Scale Systems - with applications.*

E 25 PSYCHOLOGY FOR SYSTEM DESIGN

System Science and Psychology, Application of psychological Knowledge to System Development, Psychological Research on Man-Machine Systems Development, Man as a System Component. Human Tasks and Equipment Design, Task Analysis and Behaviour Structure of tasks.

Man and the Computer : People and Computer Systems, Systems Good and Systems bad, causes of System Failure and their prevention; importance of human factor, People at work Theory and Practice and it's implication for Computer Systems development. Acceptance of the Systems Psychology of Change, change in Computer System development, the nature of change, dealing with change, making Computer Systems acceptable.

Investigation in Computer System design, importance of investigation, How to investigate. The importance of user involvement, nature of user involvement at design and implementation stages. Job Enrichment, Applying Job Enrichment in System design.

Communication Skills and Systems analyst. Case Studies on Man and Computer interface.

Text Books :

1. *Kenyou B DeGreene, McGraw Hill Book Co., New York : Systems Psychology*
2. *Edward A Tomeeki and M. Lazaras : People oriented Computer Systems.*

E 26 ADVANCED MANAGEMENT PRACTICES

General Introduction to Principles and Practices of Management — A Review; Towards a Science of Management. The Systems Analysis approach, The general systems view of Organisation, Systems and Management; Business Systems characteristics, Business organisations seen as systems.

The new Realities — Productive work and Achieving worker. Management in a changing world. The nature of work force, Consumer Movements and its impact on Management.

Social values and Social Responsibility, Management and Quality of life, the limits of social Responsibility, Business and Government, the Ethics of Responsibility.

Technology — The impact on individuals, Human Relations, Management. Adapting Management to technology, Technology, Management and Effectiveness.

The Manager's work and Jobs, Managerial Skills, Managerial organisation, Top Management : Tasks organisation and Strategies.

Text Books :

1. *Peter F. Drucker Allied Publishers : Management : Tasks, Responsibilities, Practices*
2. *R. Koontz and C.O'Donnell — McGraw Hill Publishers : Management : A systems and contingency Analysis of Managerial Functions (6th edn.)*

E 27 MANUFACTURING SYSTEM DESIGN

Design of manufacturing systems; designing for manufacturing; new processes, equipments and materials; Modernization and technological upgradation of manufacturing systems for various industries; automation; transfer lines; flexible manufacturing system; industrial robotics; NC DNC, CNC, DINC machines; computerised manufacturing systems; computer aided design; computers in continuous process control.

1. *V. Damiulovsky — 1973 : Manufacturing Engineering*
2. *W.J. Patton — 1975 : Materials in Industry*
3. *U. Rombold, M.K. Sirth, J.S. Weinstan — 1977: Computers in Manufacturing.*

E 28 MICROPROCESSOR BASED SYSTEMS

Information Representation, Interpretation and Operation : Digital System and Binary Code Word, Codes for numerical information and non-numerical information. Binary Logic and Arithmetic Operation.

Combinational Networks : Logic gates and digital circuits Logic equation and minimization, logic diagrams, Important combinational Networks.

Sequential Networks : State Table and State Diagram Converting a state table into a logic diagram and vice versa. Important Sequenctional net works.

Design of Conventional Digital networks : Vending machine control unit, simple processor

6800 Microcomputer system Architecture : Instruction coding in 6800, An abreviated 6800 Instruction set, Programme coding and execution.

6800 Instruction Set : Programmers' cards for 6800. Manipulating internal process registers, Addressable location temporary data between accumulated and slack, program counter, interupts program execution.

Assembly Language Instruction : Assembly proforma, program Analysis special programming problem, Software support.

Writing Proforma : Flow charts, substitution process. Program Development.

6800 Microcomputer Family Hardware : Micro Processor families, Microprocessor Hardware, Memory Hardware, Parallel-Interface Hardware, MC 6801 Microcomputer Device.

Design of Microcomputer — Based Digital Networks : Vending Machine control unit, Digit Voltmeter.

Text Books :

1. *Gault & Pimmel, McGraw Hill :* Introduction to Micro Computer based Digital System.
2. *Cooper (J.A.), Prentice Hall :* Microprocessor background for Management Personnel.

E 29 ADVANCED MARKETING MANAGEMENT

Strategic Planning & Marketing Planning Decisions.
Analysing Market Opportunity and Company Ability.
Marketing Organisation, Types Evaluation : Role of Product Manager.

Types of Market Research and Decision Making.
Industrial Marketing — Salient Aspects.

Product Planning and Development.

Pricing Decisions and Strategies.

Quantitative Approaches to Marketing Decision.

Marketing Strategies and Financial Implications.

Marketing Information Systems.

Distribution Management.

1. *Philip Kotler :* Marketing Management and Strategy : 3rd Edition.
2. *Abell — Hammond Prentice Hall :* Strategic Marketing Planning Problems and Analytical Approaches.

E 30 PORTFOLIO MANAGEMENT

Risk Analysis and its role in Portfolio Management.

Risk, efficiency and diversification aspects affecting a firm.

Portfolio Analysis — Mathematical Models.

Capital Market in Indian Environments, Share, Securities and Stock Exchange.

Capital Market Theory : Formulating the Balance Sheet Analysis, return on Equity computation — Shadow price influences and Analysis.

Market Price Fluctuations -- Trends and Analysis.

Selection of Portfolio — Optimal Combinations.

Institutional Aspects in Portfolio Management.

Text Books :

1. *Jack Clard Francis & Stephen H. Archer, Prentice Hall :* Portfolio Analysis.
2. *William F. Sharpe, McGraw Hill :* Portfolio Theory & Capital Markets.

E 31 ARTIFICIAL INTELLIGENCE

What is Artificial Intelligence : A definition, What is an AI technique, level of model, criteria for success.

Problem Solving : Problem as a State Space Search, Problem characteristics, Production System characteristics.

Basic Problem Solving Methods : Formed vs background reasoning, Problem types vs Problem groups, Knowledge representation and the frame problem, Macteling, Hemistic function, wealth methods Analyzing Search Algorithms.

Game Playing :Min-map Search, Adding Alpha-beta cutoffs, Adding refinement, limitations of methods, Reference on Specific games.

Knowledge Representation : Knowledge representation using prediction Logic and using after Logics, Structured representation of knowledge.

Advanced Problem Solving System : Playing, System organization Expert System and its structure, Instruction on expert system.

Natural Language Understanding : What is understanding? Understanding single and multiple Sentences, (Language Genetics)

Perception and Learning : Solving perceptual problem, Constraint Satisfaction (Waltz Algorithms) Random learning and neural nets, role learning, Learning in GPSS Conceptual learning, Discovery as learning, learning by Analogy.

Implementing AI System : AI languages, Important characteristic (IPL, LISP, SAIL, PLANNER, KRL, PROLOG) Computer Architecture for AI Application.

Text Books :

1. *Flaimerich* : Artificial Intelligence.

MEDALS AND PRIZES

The following medals and prizes are available for awarding at the time of convocation to the students of Post Graduate Programme in Industrial Engineering of each batch.

CHAIRMAN'S GOLD MEDAL Chairman's Gold Medal is awarded for standing first in the Post Graduate Programme in Industrial Engineering.

DIRECTOR'S PRIZE Director's Prize is awarded for the best final project completed in the final year of Post Graduate Programme in Industrial Engineering.

DR. KRISH PENNATHUR'S ROLLING SHIELD AND MEDAL Dr. Krish Pennathur's Rolling Shield and individual medal is awarded to the best PGP student in Production Management area.

DR. PRANLAL PATEL AWARD Yearly Award of Medals to the Best Student at the end of the First Year and the Second Best Student at the end of the Post Graduate Programme.

ORSI-14TH CONVENTION AWARD The best PGP student in O.R. Stream is awarded Gold Medal and a certificate.

PLACEMENT

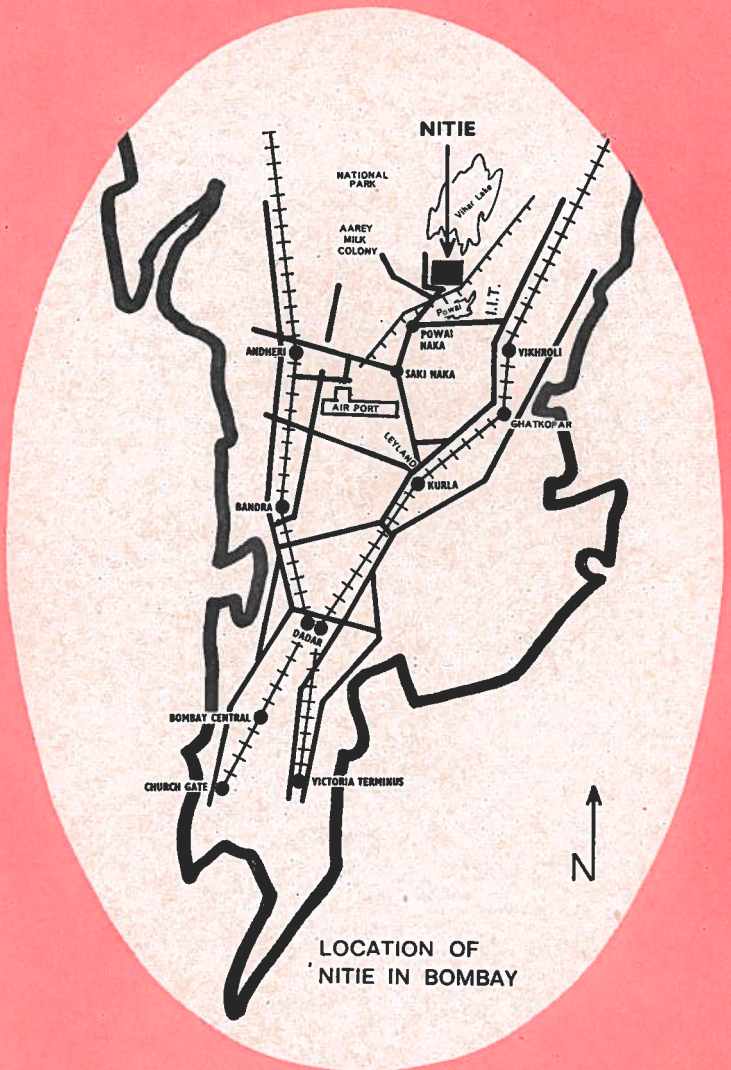
Recognising the importance of effective placement and the increasing emphasis of employers on Post Graduate qualification in Industrial Engineering, NITIE helps the successful candidates to secure suitable employment in industries, business and government sectors. Guidance is given to the students in their choice of the fields for which they are best qualified. Counselling sessions and reference literature on a variety of organisations also assist in meeting this objective. The aim of the placement programme is to bring the students and the industrial community together in mutually desirable employment relationship. The Institute has a threefold obligation in this respect; to the students, to the Industrial Engineering profession and to itself. This policy, coupled with strict adherence to high standards in the selection

of students for admission and their continuous evaluation during the programme is expected to open exceptional opportunities with leading organisations. The first twelve batches of students of NITIE have joined Industry at various levels and functions.

Organisations where our Post-Graduates are/were placed include:

1. ABC Consultants Chandigarh/Delhi/Lucknow.
2. Automotive Corporate Services Pvt. Ltd., Delhi.
3. Asian Paints Ltd., Bombay.
4. The ACC Limited, Bombay/Shahabad/Guntur.
5. Bajaj Tempo Limited, Pune.
6. Bajaj Auto Limited, Pune.
7. Balsara & Co. Pvt. Ltd., Bombay.
8. Bajaj Electricals Ltd., Bombay/Hyderabad.
9. Bharat Bijlee Ltd., Thane.
10. Bharat Gears Ltd., Bombay.
11. Billimoria Consultants Ltd., Bombay.
12. BEL (Bharat Electronics Ltd.)
13. BHEL, Bhopal/Delhi/Hardwar/Hyderabad/Bangalore.
14. Bhoruka Steel Ltd., Bangalore.
15. Bombay Dyeing & Mfg. Co. Ltd., Bombay.
16. Bharat Electronics Ltd., Bangalore/Gaziabad.
17. Bradma India Ltd., Bombay
18. Brite Brothers Ltd., Bombay.
19. Computronics India, Bombay
20. CP Tools (I) Ltd., Bombay.
21. Crompton Greaves Ltd., Bombay.
22. Excell Industries Ltd., Bombay/Bhavnagar.
23. Engineers India Ltd., New Delhi.
24. Eicher Goodearth Ltd., New Delhi.
25. Food Specialities Ltd., Delhi.
26. Garware Plastics Ltd., Bombay
27. Garware Paints Ltd., Thane.
28. Ganson Limited, Bombay.
29. Genelec Limited, Bombay.
30. The GEC of India Ltd., Calcutta/Naini.
31. Godrej & Boyce Mfg. Co. Pvt. Ltd., Bombay

32. Godrej Soaps Ltd., Bombay.
33. Gujarat Steel & Tubes Ltd., Ahmedabad.
34. HMT Limited, Bangalore/Hyderabad/Pinjore.
35. Hoechst Ltd., Bombay.
36. Hindustan Brown Boveri Ltd., Baroda.
37. Hindustan Computers Ltd., Bombay.
38. Humphreys & Glassgow Consultants Pvt. Ltd., Bombay.
39. Hindustan Lever Ltd., Bombay.
40. Hindustan Steel Ltd., Bokaro.
41. HAL Bangalore/Nasik.
42. Hindustan Petroleum Corpn. Ltd., Bombay.
43. Hindustan Construction, Bombay.
44. Ingersoll Rand India Ltd., Bangalore.
45. Indian Air Force
46. Indian Army
47. IBM World Trade Corpn. Ltd., Bombay.
48. ITC Limited, Saharanpur.
49. IDM Limited, Bombay.
50. IDPL, Delhi.
51. ITI Limited, Bangalore.
52. Infosys, Bangalore.
53. ICIML, Bombay/Pune/Madras.
54. Indian Petrochemicals Ltd., Baroda.
55. JK Synthetics Ltd., Kota.
56. Kelvinators, Faridabad.
57. Kores (I) Limited, Bombay.
58. Kothari Chemicals, Madras.
59. Kirloskar Brothers Ltd., Pune.
60. Kudremukh Iron & Ore Co. Ltd., Bangalore.
61. Kenetic Engineering Ltd., Ahmednagar/Pune.
62. Larsen & Toubro Ltd., Bombay.
63. Liberty Oil Mills Ltd., Bombay.
64. Mico Ltd., Bangalore.
65. Mafatlal Engineering Industries Ltd., Thane.
66. Mafatlal Spinning & Weaving Mills, Navsari.
67. Mukund Iron & Steel Works Ltd., Thane/Bombay.
68. Metal Box Co. of India Ltd., Calcutta.
69. Mettur Beardsell Ltd., Madras.
70. Murphy India Limited, Thane.
71. NITIE, Bombay.
72. NOCIL, Thane.



LOCATION OF
NITIE IN BOMBAY

ABOUT NITIE

NITIE was established as a National Institute in 1963 by the Government of India with the assistance of the United Nation Development Programme through the International Labour Organisation.

NITIE offers 1½ year Post-Graduate Programme, Post Graduate Programme by Research, Fellowship Programme at Doctoral level in Industrial Engineering and has been conducting several short-term Executive Development Programmes ranging from one to two weeks duration in various areas of Industrial Engineering. The training programmes of NITIE emphasize upon learning with a purpose and professional approach and are accompanied by an abiding concern for man. Besides training, NITIE is also engaged in applied research and offers consultancy in the various facets of industrial engineering, operations research, information systems and computers, marketing, personnel and other related productivity and management fields.

NITIE faculty, drawn from various basic disciplines, have diverse experience in business, industry and government, and thus are able to bring to bear academic concepts to the practical problems. By introducing new concepts, techniques and programmes to meet the changing needs arising out of rapid technological developments and socio-economic transformation, NITIE endeavours to equip the managers, administrators and specialists in government, public utilities, industry and other services sectors with the necessary skills for efficient performance of their functions.

NITIE publishes quarterly, a professional journal UDYOG PRAGATI. This deals with new developments in industrial engineering and allied fields. Members of Alumni Association are entitled to a copy of journal. Participants of Executive Development Programmes of duration of a week or more are also eligible to become members.

NITIE Campus is located in one of the most picturesque surroundings of Bombay and is flanked by the Powai and Vihar Lakes. NITIE has physical facilities to conduct concurrently six courses and can accommodate at a time 150 participants in self-contained single rooms. The classrooms, syndicate rooms and the auditorium are air-conditioned.

NITIE is administered through a Board of Governors representing industry, government, labour and professional bodies, with Shri B. M. Gogte as Chairman and Dr. S. Ramani as Director.

INDUSTRIAL SAFETY AND AUTOMATION

A One-week Residential Course
at NITIE



Course Leaders :
Prof. E Unnikrishnan
Prof. Amitabha De

**NATIONAL INSTITUTE FOR TRAINING IN
INDUSTRIAL ENGINEERING**

Vihar Lake, Bombay - 400 087.

GRAM:
NITIE, BOMBAY-400 076

PHONE : 58 33 71
TELEX : (011) 71392

INDUSTRIAL SAFETY AND AUTOMATION

Introduction

The main purpose of this course is to provide a general understanding of the human-product-process interface design problems as applied to industrial safety and automation so that engineers, managers and designers can design man-machine systems for greater safety, efficiency and comfort. Topics related to the industrial environment will also be discussed in this course.

Objectives

- * To develop industrial designs and man-machine systems, which will minimise the stress and strain from products and processes so that human failure could be minimised.
- * To provide product designs which are oriented towards greater safety, better quality, efficiency and greater comfort.
- * To provide systematic methodology for mechanisation and automation in industries, which are oriented towards appropriate technology.
- * To enhance the effectiveness of facilities in industries such that better employee health, better safety and greater job satisfaction could be obtained.
- * To understand the physical environment around the job, its effect on the employees and to provide a better and safer working environment.

Content

- * Man-machine systems design oriented towards safety.
- * Anthropometry and work systems design.
- * Psycho-physiological measurement of work.
- * Control of the physical environment.
- * Mechanical, Electrical and Chemical hazards in industry and safety precautions.
- * Safety and Human Engineering in transportation.
- * Principles of automation, mechanisation and appropriate technology.
- * Case studies of Human Engineering in safety and automation applied to industrial systems, transportation, consumer products, physical layouts, structural design etc.
- * Laboratory visits.

Course Leaders : Prof E Unnikrishnan
Prof Amitabha De

Duration

One week. The course will commence on Monday morning and will conclude on Friday.

For Whom Meant

Product, process and project engineers, industrial engineers, design engineers, safety officers, supervisors, system designers and managers in the middle and senior management levels.

Fee

Rs. 1,200/- (US \$ 250.00 in case of foreign participants) to cover Tuition, Course Material, Lodging & Boarding and Institutional Amenities. Demand Draft may please be drawn in favour of 'NITIE, Bombay'. Fee once paid will not be refunded. Please see Refund Rules printed on the reverse of the Enrolment Form.

Enrolment

The last date for receipt of enrolment form, duly completed in all respects along with fee, is **three weeks** (Three months in case of foreign participants) before the scheduled date of commencement of the course. In case of non-availability of form, the following details on a plain paper should be supplied to determine the eligibility:— Name, Designation, Age, Qualification, Experience (on the job and number of years) and the Present Functions. The Enrolment Form together with fee should be sent to:

Assistant Registrar (Programme)
NITIE
Vihar Lake
Bombay-400 087

Course Starts on 25 Feb 1985 Ends on 1 Mar 1985

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NITIE publishes quarterly, a professional journal **UDYOG PRAGATI**. This deals with new developments in industrial engineering and allied fields. Members of Alumni Association are entitled to a copy of journal. Participants of Executive Development Programmes of duration of a week or more are also eligible to become members.

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WORK STUDY (INCLUDING ONE WEEK PROJECT)

A Three-week Residential Course
at **NITIE**

Starts on 18 Nov 1985 Ends on 6 Dec 1985



Course Leaders :
**Dr. E. Unnikrishnan/
Prof Amitabha De**

**NATIONAL INSTITUTE FOR TRAINING IN
INDUSTRIAL ENGINEERING**

Vihar Lake, Bombay - 400 087.

GRAM :
NITIE, BOMBAY-400 076

PHONE : 58 33 71
TELEX : (011) 71392

WORK STUDY (INCLUDING ONE WEEK PROJECT)

Introduction

Work Study is an introductory as well as an appreciation course incorporating lectures, discussions and illustrations of the techniques of **Method Study** and **Work Measurement**. Work Study is one of the most powerful techniques for increasing the effectiveness of resources and enhancing productivity. It is applicable to a wide range of activities such as industries, offices, administration, public systems etc.

This three week course on **Work Study** will impart systematic training on the methodologies involved and also expose the participants on the latest developments in this field to make work more humane as well as towards raising productivity in the work organisations in any sector of our economy. Some of the useful concepts of Ergonomics will also be introduced in this course. Another interesting aspect of this course is a practical project oriented towards learning the **Work Study** concepts using a One Week Laboratory/ Workshop case study session as part of the course.

Objectives

1. To provide a general understanding of the recent developments and applications of Methods Engineering, Time Standards and Ergonomics.
2. To design and develop industrial systems and man-machine systems, which are oriented towards greater efficiency, productivity, comfort and safety.
3. To highlight the uses, importance and right methods in the development of time standards.
4. To introduce a new systematic methodology for mechanisation and automation in industries, which are oriented towards low cost automation and appropriate technology.
5. To give exposure to the development of methods and standards through interesting exercise and case studies.

Contents

- * Concept of productivity — its measurement.
- * Methods Engineering and Work System Design.
- * Micromotion Study.
- * Man-Machine Systems Design
- * Human Factors in Engineering
- * Time Standards — Development and Uses

- * Performance Rating and Allowances
- * Predetermined Motion Time Systems
- * Work Sampling
- * Psycho Physiological Evaluation of Work Systems.
- * Industrial Environment — Evaluation and Control
- * Case Studies and Laboratory exercises on above Topics.

Duration

Three weeks. The course will commence on Monday Morning and will conclude on Friday of the concluding week.

To Whom meant

Industrial Engineers, Product Engineers, Process Engineers, Project Engineers, Design Engineers, Supervisors, System Designers and Executives at junior, middle and upper-middle level.

Fee

Rs. 3600/- (US \$ 750.00 in case of foreign participants) to cover Tuition, Course Material, Lodging & Boarding and Institutional Amenities.

Demand Draft may be drawn in favour of 'NITIE, Bombay'. Fee once paid will normally not be refunded. However, special cases will be considered as per rules printed on the reverse of the enrolment form.

Enrolment

The last date for receipt of enrolment form (duly completed in all respects and with the fee) is **three weeks** (three months in case of foreign participants) before the scheduled date of commencement of the course. In case of non-availability of form, the following details on a plain paper should be supplied to determine the eligibility — Name, Designation, Age, Qualification, Experience (years) and the Present Functions. The Enrolment Form together with a **Demand Draft in favour of NITIE** towards the fee should be sent to :

Assistant Registrar (Programme)
NITIE
Vihar Lake
Bombay-400 087

Course Leaders : Dr. E. Unnikrishnan/
Prof. Amitabha De

Course Starts on 18 Nov 1985 Ends on 6 Dec 1985

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NITIE faculty, drawn from various basic disciplines, have diverse experience in business, industry and government, and thus are able to bring to bear academic concepts to the practical problems. By introducing new concepts, techniques and programmes to meet the changing needs arising out of rapid technological developments and socio-economic transformation, NITIE endeavours to equip the managers, administrators and specialists in government, public utilities industry and other services sectors with the necessary skills for efficient performance of their functions.

NITIE publishes quarterly, a professional journal **UDYOG PRAGATI**. This deals with new developments in industrial engineering and allied fields. Members of Alumni Association are entitled to a copy of journal. Participants of Executive Development Programmes of duration of a week or more are also eligible to become members.

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METHODS, STANDARDS AND HUMAN FACTORS IN INDUSTRY AND PRODUCTION

A One-week Residential Course
At NITIE

Starts on 14 Oct 1985 Ends on 18 Oct 1985



Course Leaders :
Dr. E. Unnikrishnan/
Prof. Amitabha De

**NATIONAL INSTITUTE FOR TRAINING IN
INDUSTRIAL ENGINEERING**

Vihar Lake, Bombay - 400 087.

GRAM :
NITIE, BOMBAY-400 076

PHONE : 58 33 71
TELEX : (011) 71392

METHODS, STANDARDS AND HUMAN FACTORS IN INDUSTRY AND PRODUCTION

Introduction

The main purpose of this course is to provide a general understanding of the recent developments and applications of Methods Engineering, Time Standards and Human Factors in the Industrial Engineering and Management field so that engineers and designers can design man-machine systems for greater productivity, efficiency, comfort and safety.

Objectives

1. To develop industrial systems and man-machine systems for greater efficiency, productivity, comfort and safety.
2. To highlight the importance, uses and right methods of development of time standards.
3. To provide engineers, designers and managers an understanding of the importance of Human Factors Engineering in man-machine systems design.
4. To provide systematic methodology for mechanisation and automation in industries, which are oriented towards appropriate technology.
5. To enhance the effectiveness of facilities in industries such that better employee health, better safety and greater job satisfaction could be obtained.
6. To understand the physical environment around the job, its effect on the employees and to provide a better and safer working environment.

Content

- * Methods Engineering and Work systems design
- * Man-machine systems design
- * Human Factors in Engineering
- * Time standards-development and uses
- * Rating and allowances
- * Predetermined Motion Time systems
- * Work sampling

- * Job Stresses and strain-Evaluation and Control
- * Psycho-physiological evaluation of work systems
- * Industrial environment-evaluation and control
- * Principles of safety engineering
- * Case studies on the above areas
- * Laboratory visits

Duration

One week. The course will commence on Monday morning and will conclude on Friday.

For Whom Meant

Product, process and project Engineers, Industrial Engineers, Design Engineers, Safety Personnel, Supervisors, System Designers and Managers in the middle and senior management levels.

Fee

Rs. 1200/- per week (US \$ 250.00 in case of foreign participants) to cover Tuition, Course Material, Lodging & Boarding and Institutional Amenities.

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Vihar Lake
Bombay-400 087

Course Leaders : Dr. E. Unnikrishnan/
Prof. Amitabha De

Course Starts on 14 Oct 1985 Ends on 18 Oct 1985

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CANCO

additional

EXECUTIVE DEVELOPMENT PROGRAMMES

June—December 1984

NATIONAL INSTITUTE FOR TRAINING IN INDUSTRIAL ENGINEERING
VIHAR LAKE, BOMBAY-400 087.

GRAM: NITIE, BOMBAY 76

TELEX: (011) 71392

PHONE: 58 33 71

NITIE



**NATIONAL INSTITUTE FOR TRAINING IN INDUSTRIAL
ENGINEERING VIHAR LAKE, BOMBAY-400 087**

ADDITIONAL PROGRAMMES

JUNE-DECEMBER 1984

Executive Development Programme

Sr. No.	Courses	Duration (Weeks)	Starting Date	Ending Date	Faculty
1	Human Factors in Engineering	1	23 JUL	27 JUL	Unnikrishnan, E
2	Service After Sales	1	30 JUL	3 AUG	Ramani, S
3	Industrial Marketing	1	27 AUG	31 AUG	Gopalan, VK/ New Faculty
4	Spare Parts Management	1	10 SEP	14 SEP	Ramani, S
5	Micro Processors and Applications for Management Decisions	1	24 SEP	28 SEP	Ramani, S/ Kochar, IPS
6	Marketing Research	1	8 OCT	12 OCT	Gopalan VK/ New Faculty
7	Executive Decision Making	1	15 OCT	19 OCT	Ramani, S/ Kalra, SK
8	Budget & Budgetary Control	1	29 OCT	2 NOV	Joshi, PL
9	Industries & Informatics	1	26 NOV	30 NOV	Joshi, PG (Mrs)
10	Value Engineering	2	26 NOV	7 DEC	Rastogi, BC

ELIGIBILITY: Degree/Diploma with 2/3 years experience in a responsible position. Relaxable in special cases. Specific courses may have separate eligibility conditions as detailed in the respective course brochures.

ALL COURSES ARE RESIDENTIAL

FEE. Rs. 1,200/- (US \$ 250 in case of foreign participants) per week to cover Tuition, Course Material, Lodging & Boarding and Institutional Amenities. Demand Draft may be drawn in favour of 'NITIE, Bombay'. Fee once paid will not be refunded. Please see Refund Rules printed on the reverse of the Enrolment Form.

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Name, Designation, Age, Qualification,

Experience (on the job and number of years) and the Present Functions. The Enrolment Form together with fee should be sent to:

Assistant Registrar
(Programme)
NITIE
Vihar Lake
BOMBAY 400 087.
Phone : (022) 58 33 71
Telex : (011) 71392
NITIE IN
Gram : NITIE,
Bombay-76.

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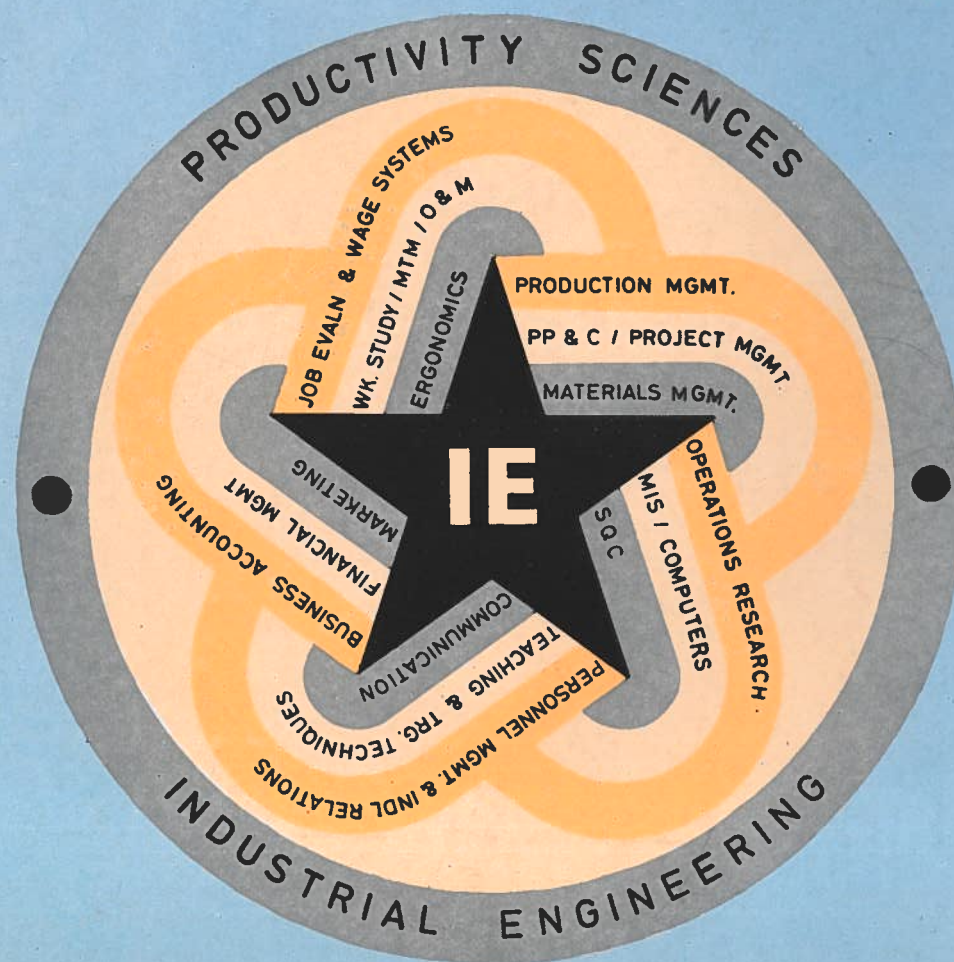
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THE BOOK CENTRE LIMITED BOMBAY 400 022



NITIE

announces

EXECUTIVE DEVELOPMENT PROGRAMME

June—December 1985



NATIONAL INSTITUTE FOR TRAINING IN INDUSTRIAL ENGINEERING

VIHAR LAKE, BOMBAY-400 087.

GRAM : NITIE, BOMBAY 76

TELEX : (011) 71392

PHONE : 58 33 71

Executive Development Programme

June-December 1985

Courses	Duration (Week/s)	Starting Date	Ending Date	Faculty
BUDGET & BUDGETORY CONTROL	1	24 Jun	28 Jun	Gopalan VK
MOTIVATION TECHNIQUES	1	24 Jun	28 Jun	Kalra SK
PERT/CPM	2	24 Jun	5 Jul	Srivastava RK
SYSTEMATIC PLANT MAINTENANCE	2	1 Jul	12 Jul	Mukhopadhyay SK
MATERIALS MANAGEMENT	2	1 Jul	12 Jul	Venkataraman T
PRE-DETERMINED MOTION-TIME SYSTEMS	1	15 Jul	19 Jul	Sukhatankar LM
PRODUCTION MANAGEMENT	2	15 Jul	26 Jul	Narayanan N
ORGANISATION & METHODS	2	22 Jul	2 Aug	Narang RV
MANAGERIAL LEADERSHIP & TEAM BUILDING	2	22 Jul	2 Aug	Sayed OB
COST REDUCTION	2	5 Aug	16 Aug	Sukhatankar LM
PLANT ENGINEERING	2	12 Aug	23 Aug	Mohanty RP/Biswas PK
INDUSTRY & INFORMATICS	1	12 Aug	16 Aug	Joshi (Mrs) PG
ACHIEVEMENT MOTIVATION FOR HIGHER PRODUCTIVITY	1	12 Aug	16 Aug	Kalra SK
MANPOWER PLANNING PERSPECTIVES AND PROBLEMS	2	19 Aug	30 Aug	Agrawal RK
ZERO-BASE BUDGETING AND ASSOCIATED MANAGEMENT ACCOUNTING CONCEPTS	1	19 Aug	23 Aug	Joshi PL
WORKSHOP ON CASE TRAINING METHODS	1	19 Aug	23 Aug	Shamanna K
VALUE ENGINEERING	2	26 Aug	6 Sep	Rastogi SC
FINANCE FOR NON-FINANCE EXECUTIVES	2	26 Aug	6 Sept	Gopalan VK
SPARE PARTS MANAGEMENT	1	2 Sep	6 Sep	Muthukrishnan K
ORGANISATION DEVELOPMENT: CONCEPTS & PRACTICES	1	2 Sep	6 Sep	Sayed OB
MANAGERIAL EFFECTIVENESS	2	2 Sep	13 Sep	Sheth (Mrs) MG
HUMAN RELATIONS	2	9 Sep	20 Sep	Kalra SK
PRODUCTIVITY LINKED WAGE INCENTIVES	1	16 Sep	20 Sep	Blaggan KK
ENERGY MANAGEMENT	1	16 Sep	20 Sep	Jayasankar V/Kochar IPS
STORES MANAGEMENT	2	23 Sep	4 Oct	Narang RV
PROJECT MANAGEMENT	2	23 Sep	4 Oct	Mathew T
INDUSTRIAL MARKETING	1	23 Sep	27 Sep	To be announced
MANAGERIAL SKILLS FOR TECHNICAL PERSONNEL	2	30 Sep	11 Oct	Mohanty RP
PLANT LAYOUT AND MATERIALS HANDLING	2	7 Oct	18 Oct	Rastogi SC
CORPORATE PLANNING STRATEGIES	1	7 Oct	11 Oct	Gopalan VK
PERSONNEL ADMINISTRATION & INDUSTRIAL RELATIONS	2	7 Oct	18 Oct	Mathur HB
ORGANISATION & TECHNIQUES OF TRAINING	2	7 Oct	18 Oct	Shamanna K
METHODS STANDARDS & HUMAN FACTORS IN INDUSTRY & PRODUCTION	1	14 Oct	18 Oct	Unnikrishnan E/De Amitabha
PRODUCTION PLANNING & CONTROL	2	28 Oct	8 Nov	Rao US
FINANCIAL MANAGEMENT	2	28 Oct	8 Nov	Gopalan VK
COMPUTER SECURITY	1	4 Nov	8 Nov	Jayasankar V/Kochar IPS
COMMUNICATION IN INDUSTRY	1	4 Nov	8 Nov	Sheth (Mrs) MG
WORK STUDY (INCLUDING ONE WEEK PROJECT)	3	18 Nov	6 Dec	Unnikrishnan E/De Amitabha
OPERATIONS RESEARCH IN PRACTICE	2	18 Nov	29 Nov	Philipose (Mrs) S
ADVANCED ORGANISATION & METHODS	1	25 Nov	29 Nov	Blaggan KK
PRODUCTIVITY PROGRAMME FOR SMALL/MEDIUM SCALE INDUSTRIES	2	25 Nov	6 Dec	Agrawal RK
INDUSTRIAL DISTRIBUTION SYSTEMS	1	2 Dec	6 Dec	Mohanty RP/Muthukrishnan K
RATING WORKSHOP	1	2 Dec	6 Dec	Narang RV
QUALITY CONTROL	2	2 Dec	13 Dec	Chakraborty S
COMPUTER SYSTEMS ANALYSIS & DESIGN	2	2 Dec	13 Dec	Ghosh (Mrs) S
PERSONNEL FOR NON-PERSONNEL EXECUTIVES	1	9 Dec	13 Dec	Mathur HB
EFFECTIVE LEADERSHIP STYLES	1	9 Dec	13 Dec	Shamanna K
SYSTEMATIC PLANT MAINTENANCE	2	16 Dec	27 Dec	Mukhopadhyay SK
PRODUCTION MANAGEMENT	2	16 Dec	27 Dec	Venkoba Rao TS
PURCHASING MANAGEMENT	2	16 Dec	27 Dec	Jayasankar V
EFFECTIVE MANAGERIAL DELEGATION	1	16 Dec	20 Dec	Sheth (Mrs) MG
MARKETING MANAGEMENT	2	23 Dec	3 Jan	To be announced

ELIGIBILITY : Degree/Diploma with 2/3 years experience in a responsible position. Relaxable in special cases. Specific courses may have separate eligibility conditions as detailed in the respective course brochures.

ALL COURSES ARE RESIDENTIAL

FEE

Rs. 1200/- per week (US \$ 250.00 in case of foreign participants) to cover Tuition, Course Material, Lodging & Boarding and Institutional Amenities.

Demand Draft may be drawn in favour of 'NITIE, Bombay'. Fee once paid will normally not be refunded. However, special cases will be considered as per rules printed on the reverse of the enrolment form.

ENROLMENT

The last date for receipt of enrolment form (duly completed in all respects and with the fee) is **three weeks** (three months in case of foreign participants) before the scheduled date of commencement of the course. In case of non-availability of form, the following details on a plain paper should be supplied to determine the eligibility — Name, Designation, Age, Qualification, Experience (years) and the Present Functions. The Enrolment Form together with a **Demand Draft in favour of NITIE** towards the fee should be sent to :

Assistant Registrar
(Programme)
NITIE
Vihar Lake
BOMBAY 400 087
Phone : (022) 58 33 71
Telex : (011) 71392NITI IN
Gram : NITIE,
Bombay-76.