INTRODUCTION

Seventeen engineering disciplines are included in the Examination Syllabus issued by the Canadian Engineering Qualifications Board of Engineers Canada.

Each discipline examination syllabus is divided into two examination categories: compulsory and elective. A full set of Industrial Engineering examinations consists of nine, three-hour examination papers. Candidates will be assigned examinations based on an assessment of their academic background. Examinations from discipline syllabi other than those specific to the candidates’ discipline may be assigned at the discretion of the constituent Association/Ordre.

Before writing the discipline examinations, candidates must have passed, or have been exempted from, the Basic Studies Examinations.

Information on examination scheduling, textbooks, materials provided or required, and whether the examinations are open or closed book, will be supplied by the constituent Association/Ordre.

INDUSTRIAL ENGINEERING EXAMINATIONS

GROUP A

COMPULSORY EXAMINATIONS (SIX REQUIRED)

98-Ind-A1 Operations Research


98-Ind-A2 Analysis and Design of Work

Methods of work analysis, including process analysis, activity charts, person machine charts, operation analysis, micromotion study, fundamental hand motions and film analysis. Principles of motion economy, method study, motion and time study, rating factor, performance factor, allowances and standard data. Pre-determined motion time systems. Work sampling. Wage payment. Motivation and work. Wage incentives. Job enrichment. Software available in the field of analysis and design of work.
98-Ind-A3  Facilities Planning

Strategic planning, site selection, product, process, schedule, activity relationship and space requirements, personnel requirements. Developing solutions, including material handling systems and equipment, layout and computer aided layout. Functions, including receiving and shipping, storage and warehousing, production, offices and services. Evaluating solutions, including deterministic and probabilistic models. Selection, implementation, and periodical review of the layout.

98-Ind-A4  Production Management

Production systems, including identification of technical, economic, social, human components and characteristics in the system. Forecasting techniques. Inventories, including role, measuring service level, inventory models and their application in distribution and manufacturing. Aggregate planning of production levels and inventories, including master plan, materials requirements planning (MRP), detailed scheduling and sequencing, assembly line balancing. Information and control systems for production operations. Project planning and control.

98-Ind-A5  Quality Planning, Control, and Assurance


98-Ind-A6  Systems Simulation

GROUP B

ELECTIVE EXAMINATIONS (THREE REQUIRED)

98-Ind-B1  Applied Probability and Statistics

Basic concepts of probability, transformations of random variables and moment generating functions. Joint and conditional distributions for discrete and continuous random variables, correlation and expectation of a function of several random variables. Sums of random variables, convolutions and central limit theorem. Reliability, maintenance and repair, replacement, inventory, etc. Statistical methods: hypothesis testing, T and F tests, and nonparametric tests. Estimation of parameters. Analysis of variance in one way classifications with fixed effects. Linear regression with one or two independent variables. Goodness of fit tests.

98-Ind-B2  Manufacturing Processes


98-Ind-B3  Computer Aided Design and Computer-Assisted Manufacturing

Fundamental concepts in design and manufacturing automation strategies, high volume discrete parts production systems, numerical control manufacturing systems, computer aided manufacturing (CAM), support systems for manufacturing, group technology, and flexible manufacturing systems.

98-Ind-B4  Design of Information Systems

Analysis of existing systems and general design. The role of information for the control and management of integrated production systems. Concepts of information, humans as information processors, nature and value of information for decision-making, economics of sampling, structure of management information systems, hardware, software and control environments of information processing systems, transaction processing systems, data-base sub-systems, organizational structure and management information systems, development and evaluation of management information systems, distributed systems, local area networks, data communications. Data acquisition and transmission. Economic evaluation.

98-Ind-B5  Ergonomics

Basic human abilities and characteristics, including vision and hearing. Psychomotor characteristics. Anthropometry: static and dynamic human body dimensions and muscle strength. Environmental factors, including illumination, atmospheric conditions, noise, and vibration. Ergonomic work design, including layout of equipment, manual work aids, design of seating, and person-machine interfaces: instruments, controls, and software.
98-Ind-B6  Workplace Design

System and human engineering analysis, the human as a system component, visual presentation of information, auditory and other sensory forms of information presentation, speech communication. Human machine dynamics, including data entry devices and procedures, design of the multi human machine dynamics. Layout of work places in order to maximize productivity, comfort, health and safety of employees, locating controls and displays, design for maintainability, training system design, training device design, human engineering tests and evaluation.

98-Ind-B7  Financial and Managerial Accounting

A study of financial and managerial accounting, including basic accounting concepts, measurements of income and balance sheet presentation. Accounting records and systems, including financial statement analysis, chartered accountant reports, and funds flow. Cost and management accounting, including standard cost and variance analysis, allocation and control of costs. Accounting in business decisions, including budgeting, cash flow forecasting, and planning.

98-Ind-B8  Computer Integrated Manufacturing (CIM)


98-Ind-B9  Logistics: Transportation Aspects

Introduction to transportation engineering, and transport planning and economics. Modeling of transportation and warehousing problems. Characteristics of transportation systems: rail, highway, airway, waterway, and pipeline. The rural and intercity transport system in Canada; cost and tariffs. Network analysis; the transport planning process. Logistics and competitiveness: evaluation of transportation projects and systems, urban transportation analysis and prediction, traffic studies, highway and intercity capacity, characteristics of traffic flow, traffic control principles, and economics.

98-Ind-B10  Industrial Safety and Health