

PROPOSAL RECOGNISED BY BHARATHIAR UNIVERSITY

of

BASIC QUALITY MANAGEMENT COURSE

1. **Introduction**

The Basic Quality Management Course is designed for officers newly inducted into the DGQA organisation. The student community consists of service Officers who are posted on tenure to DGQA and Group 'A' civilian officers.

2. **Objective of the course**

The officers will get adequate training on the QA policies & procedures in vogue at DGQA in the discharge of its organizational duties. They would also be exposed to the contemporary QA trends & Management concepts as well as the tools and techniques available for utilizing these concepts in practice at their respective places of work. At the end of the course they would have a comprehensive understanding of the role and responsibilities of DGQA, agencies interacting with DGQA, organisations which form the customer & supplier base of DGQA. Fully equipped with knowledge on the Quality Assurance and Quality / Reliability Management processes and process parameters, this course will enable them to identify gaps in the system if any and take remedial measures resulting in enhancement of organizational excellence.

3. **Selection criteria for participants**

- (a) The minimum educational qualification is graduation.
- (b) Should have served in DGQA organisation for at least 03 months as Gp officer
- (c) Service personnel of the rank of Lt Col & above on tenure at DGQA Organisation

4. **Structure of the course**

The course curriculum has been designed keeping in view the objective of the course and the echelon of the participant officers. The duration of the course is 06 months which includes 04 weeks of pre course study at work place, 05 weeks of classroom training at DIQA and 3 months post course project work on the job application of concepts learnt and dissertation of the project work.

5. Course curriculum

S No	Course No	Course Name	Credits	Marks
1	BQM101	Role & Function	3	100
	BQM102	Core Processes of DGQA		
2	BQM201	Quality and Reliability	3	100
3	BQM202	Quality Management	3	100
4	BQM203	Quality Assurance procedures	3	100
5	BQM204	Practical Work	3	-
6	BQM205	Field work	6	200
7	BQM206	Project Dissertation & Viva voce	6	200
		Total	27	800

6. Program structure

Lecture modules on courses listed below

- i) DIQA 101 - Role and Function (1 Credit)
 - a. DGQA
 - b. DGOS, WE, EME, Dte of Standardization, DRDO, MGO, DGBR
 - c. Know our Customer – Army, Navy and Air Force
 - d. Infrastructure Management
- ii) DIQA 102 - Core Processes of DGQA (2 Credit2)
 - a. Administrative processes and CCS Rules
 - b. SQA processes
 - c. Quality Assurance of imported equipment
 - d. Quality Assurance of OFB equipment / stores
- iii) DIQA 201 - Quality and Reliability (3 Credits)
 - a. Quality concepts
 - b. Statistical Quality Control
 - c. Introduction to Reliability Engineering
 - d. Statistical Software for Quality
 - e. Application of Minitab Software
- iv) DIQA 202 - Quality Management (3 Credits)
 - a. Six Sigma overview
 - b. Quality Management Systems and International Standards
 - c. Quality Audit (Product, Process and System)
 - d. Emerging Quality Management Techniques
 - e. Reliability Demonstration Methods
- v) DIQA 203 - Quality Assurance procedures (3 Credits)
 - a. Supplier assessment and Self Certification

- b. Defence Procurement Procedure and Contract Management
- c. AHSP processes
- d. Defect Investigation

Practical Work

DIQA 204 - (3 Credits)

- a. Case Studies on AHSP and QA procedures (2 Credits – 30 Hours of syndicate work)
- b. Colloquium – Presentation of syndicate Case study (1 Credit)

Field work (16 Credits)

Pre course on the job (4 Credits of preparatory study)

Post course on the job (12 Credits of application of concepts learned on the job resulting in operational excellence)

Participants are introduced to the Quality Management concepts practiced in the industries involved in manufacture of defence equipment. On completion of the class room training, the participants are expected to select a theme for application of the concepts learnt. The theme shall be chosen in consultation with the immediate supervisor at work and shall be in the area of relevance to the respective DGQA establishment in terms of improving operational excellence.

Project Dissertation & Viva voce (6 Credits)

The participant would be required to select an area of work that is considered vital to the employing division of DGQA. The Participant, in consultation with his/her Supervisor, would identify the topic of the Dissertation and prepare the detailed Dissertation outline.

7. Course syllabus

DIQA 101 – Role and Function

101a – DGQA organisation- role & function

- i) Brief history
- ii) Hierarchy and Organisation structure
- iii) Roles and Responsibilities
- iv) Hierarchical Functions –by Directorate, AHSP, field and other estts.

- v) Equipment dealt and responsibility to customers
- vi) Interacting organizations

101b – Interacting organisations - Role and functions

(DGOS, HQTG EME, Dte of Standardization, DRDO)

- i) Hierarchy and Organisation structure
- ii) Roles and Responsibilities
- iii) Levels of interaction

101c – Customer Relationship Management

(Army, Navy, Air force)

- i) Hierarchy and Organisation structure
- ii) Equipment dealt
- iii) Orders governing responsibility

101d – Infrastructure management

- i) Principles of works procedure
- ii) Types of works
- iii) Budget
- iv) Processing of works

DIQA 102 – Core Processes of DGQA

102a – Administrative processes and CCS Rules

- i) Perspective on conduct rules
- ii) Interpretation of conduct rules
- iii) Dos and don'ts for a Government servant
- iv) misconduct situations and explanation
- v) Activities requiring permission
- vi) Instructions on
 - a. Movable and immovable properties
 - b. Transactions
 - c. Sexual harassment at work
 - d. Strike
 - e. Gifts
 - f. Political representations
 - g. Marriage
 - h. Intoxication
 - i. Child labour
 - j. Annual Performance Appraisal Report

102b – SQA Processes

- i) Roles and Responsibilities of SQAEs
- ii) Functions of zonal SQAEs, QAEs, Wings and Depot advisory cells
- iii) Interpretation of Contracts
- iv) Procedure for Quality Assurance of equipment / stores from PSUs
- v) Procedure for Quality Assurance of private sector
- vi) Types of samples
- vii) Pilot sample evaluation and bulk production clearance
- viii) Process audit
- ix) Final product evaluation
- x) Policies governing Quality Assurance procedure
- xi) Delivery schedule and tendering of stores
- xii) Inspection Note- preparation and issue
- xiii) Agent inspection

102c – Quality Assurance of imported equipment

- i) Vetting of indents and contracts
- ii) Interpretation of contractual clauses
- iii) Rights and remedies of supplier and purchaser
- iv) Pre Despatch Inspection
- v) Joint Receipt Inspection
- vi) Quality claims
- vii) Warranty
- viii) Inter Governmental Committees
- ix) Defect investigation of Imported Equipment
- x) Correspondence on overseas supplies

102d – Quality Assurance of OFB equipment / stores

- i) Governing policies
- ii) Responsibilities of producer and DGQA
- iii) Depot indents
- iv) Inter Factory Demands
- v) Input material inspection
- vi) In process Quality Assurance
- vii) Surveillance Audit
- viii) Process audit
- ix) Final product evaluation

DIQA 201 - Quality and Reliability

201a – Quality concepts

- i) Quality – characteristics
- ii) Expression of Quality
- iii) Evolution of Quality concepts
- iv) Inspection
- v) Quality control
- vi) Approach to quality control
- vii) Quality Assurance

201b – Statistical Quality Control

- i) Introduction to design of experiments
 - a) Process model and quality engineering model
 - b) Utility of DOE in quality improvement
 - c) Various factors used in experimentation
 - d) Identifying sources of variation using two factor two level model and usage of same in setting process parameters.
 - e) Introduction to graphical plots used in experimentation
 - f) Introduction to analysis of data obtained through DOE
- ii) Probability
 - a) Introduction to Probability
 - b) Definition of terms related to Probability theory
 - c) Definition of process, methods of process stabilisation and applications
 - d) Tossing process refinement and application of probability
 - e) Addition and multiplication rules
 - f) Bayes theorem
 - g) Problem solving – conventional and using statistical software
 - h) Introduction to probability distributions
- iii) Quality Improvement Tools
 - a) Tally sheet
 - b) Histogram
 - c) Pareto diagram
 - d) C and E diagram
 - e) Scatter diagram
 - f) Stratification
 - g) Control chart

- iv) Statistics for Quality Assurance
 - a) Central tendencies
 - b) Dispersion
 - c) Distribution of shape
 - d) Graphical representation Sampling distribution

- v) Sampling distribution
 - a) Practical conduct of sampling distribution
 - b) Control limit theorem
 - c) Z-distribution
 - d) Students distribution
 - e) Chi square distribution
 - f) F-distribution
 - g) Problem solving

- vi) Sampling concepts
 - a) Introduction to Indian standard on sampling
 - b) Types of sampling – Attributes and variables
 - c) Parameters of sampling plan
 - d) Operational Characteristic curves
 - e) Types of sampling plan –Simple, Double Multiple sampling plan
 - f) Sampling plan wrt Attributes and variables

201c – Introduction to Reliability Engineering

- i) Concepts of reliability, availability, maintainability
- ii) Failure
- iii) Causes of failure
- iv) Cost of reliability
- v) Life curve
- vi) Failure pattern
- vii) Criteria for reliability
- viii) Redundancy
- ix) Reliability measurement
- x) Reliability prediction

201d – Statistical Software for Quality

- i) Introduction to Quality tools
- ii) Introduction to Minitab software
- iii) Guided problem solving
- iv) Exploring Help and Stat guide
- v) Unguided problem solving

201e – Application of Minitab Software

Tutorial assignment in problem solving using Minitab

DIQA 202 - Quality Management

202a – Six Sigma overview

- i) Introduction to Six sigma concept
- ii) Need for Six Sigma
- iii) Meaning of Six sigma
- iv) Constituents of Six Sigma
- v) Training hierarchy
- vi) Project phases
 - a) Define
 - b) Measure
 - c) Analyse
 - d) Improve / design
 - e) Control / validate
- vii) Poka Yoke

202b – Quality Management Systems and International Standards

- i) Hierarchy and functioning of International Organisation for Standards
- ii) Methodology of standards formulation
- iii) Introduction to Quality management system
- iv) ISO family of standards on QMS

202c – Quality Audit (Product, Process and System)

- i) Audit concepts
- ii) Definition of key words
- iii) Principles of auditing
- iv) Audit types
- v) Audit programme
- vi) Audit scope and criteria
- vii) Audit planning
- viii) Audit process
- ix) Process approach
- x) Process audit
- xi) Auditor competence

202d – Emerging Quality Management Techniques

- i) Quality characteristics

- ii) Checking of a product
- iii) Quality management evolution
- iv) Quality control
- v) Quality assurance
- vi) Quality audit
- vii) Japanese concepts
 - a. Quality circles
 - b. 5S
 - c. Poka yoke
 - d. Juran trilogy
 - e. TQM
- viii) Customer focus
- ix) Quality engineering
- x) Quality cost
- xi) Quality Function Deployment
- xii) Process quality
- xiii) Six Sigma
- xiv) Imperatives for DGQA

202e – Reliability Demonstration Methods

- i) Reliability prediction
- ii) Life cycle testing
- iii) Environmental stress screening
- iv) Highly accelerated life testing
- v) Highly accelerated stress screening

DIQA 203 - Quality Assurance procedures

203a – Supplier assessment and Self Certification

- i) Inter services guide (ISG 015) governing supplier registration and assessment
- ii) Criteria for assessment prior to registration
- iii) Criteria for assessment for renewal of registration

203b – Defence Procurement Procedure

- i) Defence procurement
 - a) Capital acquisition
 - b) Defence Acquisition Council
 - c) Registration of vendors
 - d) Defence Procurement Board
 - e) Processing development orders

- ii) Defence procurement manual – 2009
 - a) Objective of procurement
 - b) Competent financial authority
 - c) Types of Defence procurement
 - d) Process of tendering
 - e) Types of tenders
 - f) Tender evaluation

- iii) Contract Management
 - a) Laws governing contract
 - b) Condition of contract Amendments to contract
 - c) Termination of contract
 - d) Risk and expense purchase
 - e) Liquidated damages
 - f) Security deposits
 - g) Option clause
 - h) Payment terms
 - i) Arbitration

203c – AHSP processes

- i) Functions and responsibilities of AHSP
- ii) Interacting agencies
- iii) Documentation management
- iv) Inventory management
- v) Quality assurance
- vi) Introduction of equipment in to Service
- vii) DGQA approval, assignment list
- viii) List of changes
- ix) Technical documents of equipment
- x) Defect Investigation
- xi) Alternative utilization
- xii) Standardization and Codification
- xiii) Vetting of indents and supply orders
- xiv) Configuration management

203d – Defect Investigation

- i) Governing Army order
- ii) Defect investigation- objectives
- iii) Procedure for raising defect report
- iv) Action on defect report by various agencies
- v) Defect investigation- methodology

- vi) Sources of defect
- vii) Defect analysis – RCA
- viii) Follow up report
- ix) Disposal action
- x) DGQA policy

8. Reference books / manuals

- i. DIQA 101 - Role and Function
DGQA standing order
- ii. DIQA 102 - Core Processes of DGQA
Army order on Defect reports
- iii. DIQA 201 - Quality and Reliability
 - a) Continuous Improvement tools (Vol 1 & 2) – Richard Y Chang & Matthew E Niedzwiecki
 - b) Reliability Engineering – Balaguruswamy E
 - c) Reliability and maintainability by Charles E Ebeling
 - d) Introduction to Reliability Engineering by EE Lewis
 - e) Statistical Quality Control – Grant EC & Leavenworth RS
- iv. DIQA 202 - Quality Management
 - a) Six Sigma for everyone – George Eckes
 - b) Six Sigma for Managers - Gregg Brue
 - c) Juran's Quality handbook – Joseph M Juran
 - d) ISO 9001 & ISO 19011
- iv. DIQA 203 - Quality Assurance procedures
 - a) JSG 015
 - b) Defence Procurement Manual
 - c) Defence Procurement Procedure

9. Participant Evaluation System

Evaluation of performance of participants is based on regular Assignments, Projects, Case studies, spread over the duration of the program for making the course relevant and meaningful to the work and learning environment of the students.

Evaluation of Lecture Programs and Case study

The board of faculties formed for preparation and evaluation of test papers, assignments and exercises will liaise with concerned faculties for question bank along with the subject code and marks merited for each question. Evaluation will be done by the faculty on a continuous basis, throughout the program as follows:

- a. Assessment of Pre-course preparedness

- b. Class interaction and participation, assessed by respective faculty
- c. Weekly tests, held three times during the program
- d. Assessment of Syndicate Work and individual Case studies
- e. Final Test at the end of the Program

Evaluation of Field Work, Project Work / Dissertation and Viva-voce

Assessment is done in conjunction with the faculty and the immediate supervisor of the participant for the fieldwork, project work, dissertation etc. The student carries on with the dissertation work adhering to the guidelines provided, submitting all the prescribed evaluation components on time. At the end of the program, the student should submit a comprehensive dissertation report to DIQA for evaluation. The criteria for evaluation shall encompass Technical/Professional Competence, Work Progress and Achievements, Documentation and expression, Initiative and Originality, Research & Innovation, Relevance to the work environment.

S.No	Evaluation Component	Break-up of Marks
1.	Hard copy of Dissertation Outline document or Field Work document and Outline Evaluation Sheet by immediate supervisor, completed on or before the scheduled date	20%
2.	Hard Copy of partial report with Evaluation Sheet with a brief progress report, on or before the scheduled date	30%
3.	Submission of Final Dissertation/Field Work Report and Final Evaluation Sheet by the immediate supervisor	30%
4.	Presentation, Viva voce	20%

OTHER REGULATIONS:

The meeting of the **Board of Studies in Basic Quality Management** was held on **June 15, 2012** at Bharathiar University, Coimbatore to decide on the course curriculum, course structure, scheme of evaluation, etc. The following resolutions were passed in the meeting:

1. Course curriculum and contents of the syllabus submitted for consideration shall be approved,
2. Course title shall be called '**Diploma in Basic Quality Management**'.
3. Course Code shall be given as **BQM101, BQM102**, etc., for all theory subjects and for courses on Field Work and Project Dissertation & Viva-voce.
4. Grades shall be assigned according to the marks secured by the candidates.

5. Candidates who successfully complete the programme shall be issued with a **Diploma** incorporating **class/division** like First Class, Second Class, etc.
6. DIQA should suggest **two panel of examiners/faculty**, one for setting question papers and the other for evaluating the examination papers. The qualification for examiners shall be graduate/post-graduate engineering.
7. DIQA shall submit **question bank** for all the theory papers.
8. Evaluation of the papers shall be done by the **experts/faculty** chosen from the panel suggested by DIQA.
9. End examination shall be conducted by Bharathiar University.
10. Bharathiar University shall supply examination materials like answer booklets, question papers, etc., for the conduct of examinations.
11. **Internal as well as external assessment** on the performance of the candidates shall be followed for the theory papers with 60/40 ratio.
12. Performance of the candidates on practical and field work shall be assessed entirely (that is, 100 percent evaluation) by the faculty of DIQA.
13. Project Viva-voce examination shall be conducted at DIQA by the Board of Examiners. The Board shall consist of two members from DIQA and one nominated member from Bharathiar University.
14. Pattern of question paper for each theory subject shall be as follows:

Time: Three Hours

Max Marks: 100

Section A – (25 x 2 = 50 marks)
 Answer *all* questions
 Each question carries equal marks

- 1.
- 2.
- 3.
- .
- .
- .
- 25.

Section B – (5 x 4 = 20 marks)
 Answer *all* questions
 Each question carries equal marks

26. (a)

(Or)

(b)

27. (a)

(Or)

(b)

28. (a)

(Or)

(b)

29. (a)

(Or)

(b)

30. (a)

(Or)

(b)

Section B – (2 x 15 = 30 marks)

Answer *all* questions

Each question carries equal marks

31. (a)

(Or)

(b)

32. (a)

(Or)

(b)