

QUALITY ASSURANCE (QAS)

QAS 200. Fundamentals of Quality. (3 Units)

A study of the fundamentals of Quality with an emphasis on the current international standards, planning, organizations, methods and tools. Emphasizes the works of leading international Quality theorists, especially Juran and Deming.

QAS 220. Fundamentals of Measurement Science. (3 Units)

Prerequisites: MAT 131. Introductory overview of the fundamentals of measurement with emphasis on application of measurement science concepts to quality management. Upper Division.

QAS 312. Interpretation of Technical Documentation. (3 Units)

Prerequisites: MAT 153, QAS 200, QAS 220. Interpretation of basic engineering drawing concepts, including all related common symbolism and formatting. Emphasis on dimensions, tolerances, and configuration management. Introduction to Military and Federal Specifications/ Handbooks, ANSI, IEC, and ISO documents, specifications and recommended practices issued by private organizations.

QAS 325. Technical Communications. (4 Units)

Prerequisites: ENG 110, THE 120. Technical communications, written and oral, and how they differ from non-technical writing and speech. Emphasizes methods for the positive and unambiguous transfer of technical ideas so that they can be clearly understood by the reader or listener.

QAS 330. Statistical Quality Control and Inspection. (3 Units)

Prerequisites: MAT 131, QAS 200, QAS 220. Introduction to the application of statistical methodologies to the analysis and solution of quality and management problems (including probability concepts, control charts, and sampling). Focus will be on application of these tools to the inspection process.

QAS 331. The Manufacturing Process. (3 Units)

Prerequisites: QAS 312. Introduction to the fundamentals of manufacturing, where the conversion of raw materials and sub-assemblies into more useful entities adds value to the converted materials in the most efficient manner, using the least amount of time, money, space and manpower.

QAS 332. Electrical Metrology. (3 Units)

Prerequisites: MAT 131, PHY 122, QAS 200, QAS 220. Electrical measurement concepts, circuits and devices; applications to DC and AC measurements. Theory of coupled circuits in magnetic and capacitive environments, and electrical laboratory practices, with analysis, construction, and troubleshooting of circuits. Documentary control procedures for calibrations and other measurements.

QAS 335. Quality Auditing. (3 Units)

Prerequisites: QAS 200. The fundamental principles for preparing and planning, conducting, reporting and closing quality audits. Quality audit tools and techniques are introduced, with an emphasis on generally-accepted quality audit practices that support business performance.

QAS 340. Measurement Uncertainty. (3 Units)

Prerequisites: MAT 131, MAT 153, QAS 200, QAS 220. Theoretical versus actual measurements. Probability and statistical concepts to define accuracy, precision, error, uncertainty, and bias. Differences between measurement accuracy and measurement error; random and systematic error; uncertainty interval; tolerance limits; accuracy ratio; relative errors; and propagation of measurement errors.

QAS 347. Dimensional Metrology. (3 Units)

Prerequisites: PHY 122, QAS 200, QAS 220. Measurement of length, angularity, relative position, flatness, parallelism, concentricity, squareness, and threads. Lasers and optical tooling in large-scale measurements; also gauges, comparators, and measurement machines. Measurement uncertainties pertinent to dimensional metrology; sources of error; the effect of the measurement environment.

QAS 350. Physical Metrology. (3 Units)

Prerequisites: PHY 122, QAS 200, QAS 220. Theoretical and practical applications of measurement principles as applied to various physical properties. Measurement of pressure, mass, force, torque, temperature, humidity, flow, and rotational motion. Identifying sources of error, techniques to minimize errors and maintaining measurement traceability.

QAS 355. Safety and Reliability. (3 Units)

Prerequisites: MAT 131, MAT 153, QAS 200, QAS 220. Reliability, maintainability, and safety technology with practical industrial applications. Basic models; metrics; testing; methods of implementing improvements; accelerated life testing. Failure mechanisms for chemical, electro-chemical, electronics, electro-mechanical and opto-electronics systems. Introduction to software reliability. Focus on qualification for ISO 9000.

QAS 360. Fundamentals of Lean Manufacturing. (3 Units)

Prerequisites: QAS 200, QAS 220. Deals with the strategies and practices of lean production, as well as assess with areas of waste, interrelationships among the various components of a system, theories of leadership and management of people, and process variation.

QAS 395. Selected Topics in Quality Assurance. (1-4 Units)

Prerequisite: Consent of Instructor. An intensive study of an issue, concept, or theory in Quality Assurance that is of special interest to both the faculty member and the student. Repeatable course.

QAS 427. Quality Improvement. (3 Units)

Prerequisites: QAS 200, QAS 220. Quality factors involving customer satisfaction, demonstrating that meeting quality needs requires and active role by all the major sectors of an organization. Operational and statistical techniques most often used to monitor, control, and improve the quality of products or services.

QAS 445. Systems Failure Analysis. (3 Units)

Prerequisites: QAS 200 and QAS 220. Integrates Quality, Manufacturing and Procurement efforts to identify and eliminate the root causes of failures in systems, sub-systems and components, emphasizing fault tree and Pareto analyses. Hardware and statistical analysis, design of experiments, and technical data package evaluations.

QAS 450. Value Based Quality. (3 Units)

Prerequisites: QAS 200, QAS 220 and consent of instructor. Used value received, as perceived by the customer, as the primary measure of quality in the development of cohesive enterprise-wide quality management systems. A systemic approach to establishing the correct things to do and a measurement-based process for implementation.

QAS 494. Independent Study. (1-3 Units)

Prerequisites: Consent of instructor. Independent study of a particular problem under the direction of a member of the Quality Assurance Department. Repeatable course.

QAS 495. Selected Topics in Quality Assurance. (1-4 Units)

Prerequisites: Consent of instructor. An intensive study of an issue, concept, or theory in Quality Assurance that is of special interest to both the faculty member and the students. Repeatable course. Three hours of lecture per week.

QAS 496. Internship in Quality Assurance. (3 Units)

Prerequisites: Completion of all 300 level courses in the major.
Assignment in an off-campus internship with a cooperating organization, to be selected in consultation with the program coordinator. Emphasis on the role of professionalism and ethics in the life of the quality professional.

QAS 498. Directed Research in Q.A.. (3 Units)

Prerequisites: Completion of all 300 level courses in the major. Directed research on one or more topics to be selected in consultation with the program coordinator. Emphasis on the role of professionalism and ethics in the life of the Quality professional.

QAS 499. Senior Project. (3 Units)

Prerequisites: QAS 496 or QAS 498. A capstone project focusing on the role of leadership in relation to professionalism and ethical standards in the field of Quality Assurance. Graduate.

QAS 510. Advanced Probability and Statistics. (3 Units)

Prerequisites: undergraduate calculus, Probability and statistics. A study of measures of central tendency and dispersion, important discrete and continuous probability distributions, sampling theory, hypothesis testing and estimation. Linear regression and correlation will also be covered. The uses of statistics in testing, inspection, and production will be identified.

QAS 511. Quality Function Management and TQM. (3 Units)

A study of the functions and responsibilities of the quality organization. TQM concepts, quality function deployment, and the tools for continuous improvement are analyzed for sequence of use and development.

QAS 512. Reliability. (3 Units)

Prerequisite: QAS 510. Overview of reliability engineering. Use of mathematical models of predictions, confidence assessment, and systems reliability. Emphasis on practical applications for product or system design.

QAS 513. Statistical Quality Control and Sampling. (3 Units)

Prerequisite: QAS 510. The application of advanced statistical methodologies to the analysis and solution of quality and management problems, including probability theory, control charts, sampling, regression analysis and the design of experiments. Focus on statistical process control and related quality technologies.

QAS 514. Advanced Experimental Design. (3 Units)

Prerequisite: QAS 510. Analysis of statistical experimental design strategies. Planning of experiments for the best strategy and objectives.

QAS 515. Human Factors in Quality Assurance. (3 Units)

A comprehensive survey of human factors engineering theory, research and applications which are of particular relevance to quality assurance. A systems framework will be utilized, emphasizing feedback and interrelations among system components, including the human operator. Emphasis will be placed on operator constraints in the design of work processes, workplaces and instrumentation.

QAS 516. Measurement and Testing Techniques. (3 Units)

Prerequisite: QAS 510 or consent of instructor. In-depth discussion of equipment, principles and techniques of measurement assurance.

QAS 518. Quality Project Management and Productivity. (3 Units)

An in-depth examination of current theory and techniques in QA project management. Topics include description of project management techniques as well as procedures for evaluating their overall effectiveness and contributions to production and service quality.

QAS 521. Process Control and Capability. (3 Units)

Prerequisites: QAS 513 and QAS 514. Detailed study of procedures and methods for performing machine and process capability studies, troubleshooting production and test problems, and maintaining continuous production and process evaluation in manufacturing operations.

QAS 522. Applied Systems Reliability, Maintainability and Safety. (3 Units)

Prerequisite: QAS 512. Advanced and detailed analysis of appropriate reliability models, life-cycle reliability prediction and assessment, accelerated test models and techniques, test parameter variation studies, test tailoring and program plans for various reliability test types, maintainability concepts, prediction and assessment techniques, and safety programs.

QAS 523. Software Reliability. (3 Units)

A study of the theory and applications of reliability concepts as they relate to software design and implementation.

QAS 525. ISO 9000 & The Audit Function. (3 Units)

Prerequisite: QAS 511 is recommended. A study of the ISO 9000 series of quality system standards with emphasis on manufacturing and service industry applications. The studies address the standards interpretation, documentation and implementation including preparation for and creation of internal and external audits.

QAS 526. Supplier Quality Assurance. (3 Units)

Prerequisite: QAS 511. Encompasses a study of the fundamental quality requirements attendant to the successful procurement and delivery of end item products or services. It includes the basic supplier issues of specifications, site inspection, selection, rating, certification, and related quality audits.

QAS 527. Quality Measurement. (3 Units)

Prerequisite: QAS 511. Study of Quality Metrics and their application throughout the life cycle of a product or service in a business entity. The study includes Quality Standards, Customer Satisfaction, Quality Tools, Continuous Improvement, Cost of Quality, Supplier and System auditing.

QAS 530. Statistical Quality Control (SQC) for Service Professionals. (3 Units)

Techniques for applying Statistical Quality Control (SQC) in controlling processes and delivering customer services. Examines methods for establishing and maintaining SPC, QC auditing and sampling and continuous improvement in various service industries.

QAS 531. Customer Satisfaction and Quality Assurance. (3 Units)

In-depth study of current methods for obtaining customer satisfaction. Examines techniques of determining customer needs and development of customer service strategy Quality Control criteria.

QAS 532. Quality Assurance of the Service Delivery Process. (3 Units)

Analyze processes used to deliver service and methods used to assure satisfaction. Examines the relationship of Strategic Quality Planning, the Delivery process, and the usage of TQC and Quality Assurance to achieve strategic goals.

QAS 534. Change Management. (3 Units)

Prerequisite: QAS 511 is recommended. In depth analysis of current theory, empirical research and best practices related to effective implementation of Quality improvement methodologies that result in desired organizational change, both cultural and operational.

QAS 535. Lean Manufacturing. (3 Units)

Prerequisite: QAS 511 is recommended. In depth study of the theory and practices of lean production. Covers waste minimization, interrelationships among various components of a system, theories of leadership and management, and process variability reduction.

QAS 536. Six Sigma Principles and Applications. (3 Units)

Prerequisite: QAS 510 OR QAS 511 are required. QAS 511 is recommended. In depth study of the application of the six sigma process; covers content of the methodology areas of Define Measure, Analyze, Improve and Control (DMAIC) including team concepts, project management, advanced statistical process control and techniques, and measurement systems analysis.

QAS 537. Quality Function Deployment: Understanding Customer Requirements. (3 Units)

Prerequisite: QAS 511 is recommended. In depth study of the theory and application of the quality management process, Quality Function Deployment, for designing customer requirements into products and services. Course will evaluate the tools of QFD and study their application in analysis of customer requirements.

QAS 538. Evaluation and Outcome Analysis for Healthcare Delivery. (3 Units)

Examines operational and statistical techniques used to monitor, control, and improve the quality of services provided by healthcare. Considers the tools of Quality and their direct application to practical situations and healthcare processes.

QAS 539. Good Manufacturing Practices. (3 Units)

Prerequisite: QAS 511 is recommended. Current Good Manufacturing Practice regulations to assure quality of medical devices and pharmaceutical products. Covers development, manufacturing, Quality management and organizational requirements of medical devices. Pharmaceutical regulations include personnel, facilities and equipment, process and product controls, laboratory and reporting.

QAS 540. Food and Drug Law. (3 Units)

Prerequisite: QAS 511 is recommended. This course is designed to provide a practical interpretation of the food and drug laws and interpretations for professionals who are providing products or services in industries regulated by the Federal Food & Drug Administration.

QAS 541. Biomedical Quality Control Methods. (3 Units)

In depth study of quality control discipline as applied to medical device, pharmaceutical and/or biologics regulated environments. Topics include influencing discipline and applying models; methods that monitor, maintain and/or improve product or service quality; and operational efficiency.

QAS 542. Risk Management in FDA Regulated Industries. (3 Units)

Prerequisite: QAS 511 is recommended. Risk Management as applied to FDA-regulated and other industries (product and process-related); emphasizes application of risk management tools, plan and program from inception of product and process including manufacturing process and field experience of the product, process or service.

QAS 553. Lean Accounting & Financial Analysis. (3 Units)

Focus on the application of Lean Six Sigma concepts and techniques to help in the problem-solving challenges that confront today's quality professionals. Builds a strong foundation for the quality professional in any sector.

QAS 594. Ind Study In Assurance Science. (1-4 Units)

Prerequisites: Instructor and program Coordinator approval; QAS 510, QAS 511 and a minimum of five QAS courses recommended. Independent research or special project to be conducted in consultation with an instructor.

QAS 595. Special Topics by Directed Study: Quality Assurance Applications. (3 Units)

A course of study designed cooperatively by student and instructor, and approved by the Program Coordinator, in which students apply quality assurance theory and principles to a particular occupational setting relevant to their professional interests and aspirations. Repeatable course. Three hours of lecture per week.

QAS 598. Directed Research. (3 Units)

Prerequisites: Completion of 18 units toward degree and GWAR. Directed reading and research, designed cooperatively by student and instructor and approved by the program coordinator, emphasizing application of Quality Assurance theory and principles to a particular occupational setting.

QAS 599. Project. (3 Units)

Prerequisites: Completion of all other coursework in the degree program. The goal of all students enrolled in this culminating experience course is to complete a project under the guidance of an assigned instructor. It is the culminating learning experience of the program, and includes a significant written report. To meet the standards established by the faculty, the project must demonstrate a rigorous scientific approach to the quality profession.

QAS 600. Grad Continuation Course. (1 Unit)

Graduate students who have completed their coursework but not their thesis, project, or comprehensive examination, or who may have other requirements remaining for completion of their degree, may maintain continuous attendance by enrolling in this course. Signature of graduate program director required.