



Christian Brothers University

Need packaging background to improve your product design?

Want to make a transition into packaging industry?

Want to prepare yourself to become a CPP?

Desire to get a Master's Degree?

Want to enhance your career?

PACKAGING GRADUATE CERTIFICATE or **MASTER OF SCIENCE IN ENGINEERING MANAGEMENT** **WITH PACKAGING CONCENTRATION**

may be for you!

- **Take three packaging classes to get Packaging Graduate Certificate**
 - Principles of Packaging
 - Distribution & Medical-Device Packaging
 - Sustainability
- **Take eight additional engineering management courses to complete MSEM degree.**
 - **Courses are available on-line.**

For more info:

Contact Dr. Pong Malasri at pong@cbu.edu or (901) 341-3419

or visit www.cbu.edu/engineering/packaging





Master of Science in Engineering Management Packaging Concentration

Program Requirements

Eight Engineering Management Core Courses:

- ENGM 600 Engineering Management Theory (3 crs.)
- ENGM 602 Engineering Accounting (3 crs.)
- ENGM 603 Engineering Finance (3 crs.)
- ENGM 604 Social/Legal/Ethical Considerations for Engineering Managers (3 crs)
- ENGM 605 Quality Assurance (3 crs.)
- ENGM 607 Operations Research (3 crs.)
- ENGM 695 Research Methods in Engineering Management (3 crs.)
- ENGM 696 Thesis (3 crs.)

Three Packaging Courses for Packaging Concentration (also required for Packaging Graduate Certificate):

- ENGM 640 Principles of Packaging (3 crs.)
- ENGM 641 Distribution & Medical Device Packaging (3 crs.)
- ENGM 642 Sustainability (3 crs.)

For those with packaging background, ENGM 640 Principles of Packaging course can be replaced by one of the following two courses:

- ENGM 650 Regulatory Affairs and Quality Systems (3 crs)
- ENGM 652 Quality Systems for the Medical Device Industry (3 crs)

Packaging Course Descriptions:

- ENGM 640 Principles of Packaging
Packaging materials, container types, processes, technology, and equipment. Packaging development process, testing and evaluation methods, standards, and equipment. Government regulations. Special projects. Three credits. (Instructors: A. Ray & Y. Zhou)
- ENGM 641 Distribution and Medical Device Packaging
Physical distribution systems and distribution hazards. Rules and regulations governing distribution packaging and industry guidelines and practices. Basics of packaging materials, forms and sterilization methods used in biomedical industry. Packaging design, development, and validation. Special projects. Three credits. (Instructors: A. Ray & Y. Zhou)
- ENGM 642 Sustainability
Sustainability criteria and sustainable packaging. Steps to sustainable packaging. Design for optimizing materials and energy. Real-life design and material innovations. Life cycle assessment, examples and carbon footprints. Current state of implementations of sustainable packaging. Special projects. Three credits. (Instructors: A. Ray & M. Tune)
- ENGM 650 Regulatory Affairs and Quality Systems
Develop a basic understanding of regulatory affairs and quality systems related to medical devices and provide a better cross-functional working relationship and process efficiency. Three credits. (Instructor: K. Armstrong & C. Scifert)
- ENGM 652 Quality Systems for the Medical Device Industry
Develop a basic knowledge and understanding of quality systems related to medical devices to provide a better understanding of the requirements across different functions. Three credits. (Instructor: S. Bell)

Instructors:

- **Asit Ray, Ph.D.**
Asit K. Ray is a professor of chemical engineering at CBU. He earned his Ph.D. from Lehigh University and has over 20 years of teaching/research experience at Auburn and CBU. Dr. Ray spent seven years in the polymer industry, and was four times a NASA/ASEE Summer Faculty Fellow engaging in polymer research at NASA Kennedy Space Center and Langley Research Center. He is actively engaged in laboratory research in polymeric and biomaterials and has published over fifteen refereed papers. Dr. Ray also serves as the Coordinator of the Packaging Engineering Certificates and Lab at CBU and is a member of IoPP and AIChE. He used his sabbatical leave in 2006 to gain hands-on experiences in different facets of medical device packaging. He was awarded a faculty development grant from CBU to develop the Medical Device Packaging laboratory. He is a member of the AIChE Sustainability committee.
- **Yongquan Zhou, M.S., CPP**
Yongquan Zhou is a project engineer in Packaging Design and Development at FedEx Corp. He received his B.E. in packaging engineering and M.E. in mechanical engineering from the Wuxi Institute of Light Industry (now Southern Yangtze University) in China, and his M.S. in packaging science from the Rochester Institute of Technology. Mr. Zhou is a Certified Packaging Professional (CPP) with more than 20 years of experience in the packaging industry, academic classrooms, and research and testing laboratories. He specializes in packaging dynamics, distribution environments, transport packaging development, package testing standards, equipment and systems, and computer simulation. Mr. Zhou serves on various IoPP, ASTM, and ISTA technical committees, and was an IoPP AmeriStar Packaging Competition judge from 1997 to 2001. He has published articles in Packaging Technology and Engineering and other magazines.
- **Michael P. Tune, B.S., CPP**
Michael P. Tune is currently the Director of Packaging Science & Technology at Schering-Plough Consumer HealthCare in Memphis, Tennessee. He is responsible for the design and technical development of primary and secondary packaging systems for various over the counter pharmaceutical, cosmetic and device products. He has a B.S. in Packaging from Michigan State University, and is a Certified Packaging Professional (CPP). He has a diverse background in quality management, primary package manufacturing and consumer products. He also holds several utility and design patents in primary packaging.
- **Kim Armstrong, M.S.E.**
Prior to consulting, Kim spent 3 years at Medtronic Spinal and Biologics working on design control activities, annual reports, PMA supplements, change control, and labeling related to cervical and lumbar arthroplasty devices. She also spent two years at Cook Med Institute developing clinical protocols and managing studies for peripheral bare metal and drug-eluting stents. Engineering principles were used to develop regulatory strategy and pre-clinical testing to obtain clearances and approvals. Kim received a Bachelor of Science in Mechanical Engineering from The University of Memphis and a Master of Science in Engineering from the department of Aeronautics and Astronautics from Purdue University. She has completed other graduate engineering courses at The University of Memphis with an emphasis in materials.
- **Christine Scifert, M.S., M.E.M.**
Prior to consulting, Christine spent 9 years at Medtronic Spinal and Biologics directing the regulatory department of 22 people. As Senior Director of the group, she set regulatory strategy, oversaw global submissions, developed a design control process, interfaced with FDA and notified bodies, oversaw modification and implementation of procedures to maintain regulatory compliance and performed due diligence activities for potential acquisitions. Prior to Medtronic, she performed evaluations of injury mechanisms associated with automobile collisions, slip and falls, and sport/recreation accidents. Christine received a Bachelor of Science in Physics from Hamline University and a Master of Science in Biomedical Engineering from University of Iowa. She also completed a Master of Engineering Management from Christian Brothers University.
- **Susan Bell, M.E.M.**
Susan Bell is a Quality professional with over 20 years of experience. She has been employed by Smith & Nephew Orthopaedics since 1989 when she began working as a Quality Inspector. Since then she has worked throughout Smith & Nephew's Quality System as a Quality Supervisor, Quality Engineer, and Quality Manager. Susan has worked in a variety of areas such as Statistical Process Control, Quality Planning/Design Control, Corrective and Preventive Action, Complaint Handling, Supplier Quality Management, Quality Software Application Development, Quality Systems Auditing, and many other areas within the Quality System. In addition to these duties, she helped develop curriculum and teach Quality classes for manufacturing and quality personnel. A Senior Member of the American Society for Quality, Susan has attained certifications as a Certified Mechanical Inspector, Certified Quality Technician, Certified Quality Auditor, Certified Quality Engineer, and Certified Quality Manager.