

Fundamentals of Explosives

short course on
Chemical & Physical Principles including
blast effects, detection, forensics & HMEs

April 30- May 2, 2013

This course examines the chemistry of explosives, the physics of detonation waves and their initiation, and the issues involved in safe handling and characterizing these. Explosive output and coupling to surroundings, with specific application to structural response, will be discussed. We will address terrorist bombings, the gathering, analysis and interpretation of evidence, improvised explosives, and explosive detection. Lecturers are internationally known experts.

Chemistry

Chemical makeup of explosives—minimum requirements to be an explosive and synthetic principles. Initiation of explosives—role of hot spots, critical diameter & detonation failure. Evaluation—strength & safety. Highlighted will be the makeup of “homemade” explosives (HMEs).

Detonation & Shock Wave Physics

Shock and detonation waves. CJ and ZND models of detonation. Fundamentals of shock response of solids. Spall. Shock growth & decay. Graphical solution of plane-shock transmission. Initiation of detonation.

Applications

Mining and military—setting requirements to match the application--Gurney energies, overpressures, role of metallization, simple models.

Detection & IED's

Critique of the various technologies used in forensics and airport screening – bulk, trace & standoff. New challenges to detection. Post blast examination & laboratory analysis

Hazards

Causes of inadvertent ignition and detonation, identification of hazards and mitigation, deflagration-to-detonation transition.

COURSE INSTRUCTORS

Dr. James Kennedy, retired from Sandia & Los Alamos National Laboratories, specialist in initiation & Gurney model

Dr. Jimmie Oxley, Professor, Chemistry, U of Rhode Island; Co-Director of DHS Center of Excellence Explosives Detection, Mitigation, Response & URI Forensic Science.

Dr. Maurice Marshall, OBE, retired Defense Science & Technology Laboratory UK; specialist in forensics of blast.

Dr. Blaine Asay, retired from Los Alamos National Lab, specializes in non-shock initiation, DDT, and shock physics.

REGISTRATION FEE: \$1450 (US) should accompany registration.

Fee includes course materials, coffee breaks, and a dinner. The fee must accompany the registration form. Space is limited and early registration is encouraged. The sponsor reserves the right to accept or decline registrations and to cancel the course and return all registration fees if enrollment is insufficient.

No refunds will be made to participants who fail to substitute or cancel by at least 5 working days before the course starts.

Registrants are responsible for their own travel and lodging arrangements. See <http://www.chm.uri.edu/forensics/introexp.shtm>

Registration Form

Fundamentals of Explosives
April 30 - May 2, 2013

Name _____

Title: _____

Affiliation: _____

Phone: _____ Fax: _____

E-Mail: _____

Address: _____

City: _____ State _____

Zip: _____ Date _____

Make checks (\$1450) payable to:
University of Rhode Island,
Chemistry Dept.

Mail Payment & Registration to:
University of Rhode Island
Chemistry Dept
Attn: Jimmie Oxley
Kingston, RI 02881

Phone/fax (401) 874-2103 ph/fax
joxley@chm.uri.edu

Credit card payment can be accepted by
H.E.R.E. Fax or email Dr. Oxley

Purchase of “Aspects of Explosive Detection”
Marshall & Oxley (ed) may be made for an
additional \$100.