

Fundamentals of Explosives

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

May 5-7, 2009

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.

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 and trace. New challenges to detection. Post blast examination and laboratory analysis

Response to Blast

Concepts of dynamic loading and response. Modal response of structures. Experimental and finite element methods and code capabilities. Coupling of blast scaling laws with structural scaling laws.

COURSE INSTRUCTORS

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

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

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

Dr. Thomas Duffey, currently consultant to Los Alamos National Lab

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

Fee includes course materials, book, 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

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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
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Credit card payment can be accepted by
HERE. Contact Dr. Oxley

