

## INTRODUCTION TO EXPLOSIVES

This short course is a carefully structured introduction to the main topics in the field of explosives: principles and chemistry of explosives, detonation, explosive performance, and shock wave dynamics, explosion measurements and instrumentation, selected applications including detection and forensics. Both fundamental theory and practical aspects will be discussed. The topics will be presented by internationally renowned experts in their respective fields and will be addressed to an audience spanning a wide range of scientific backgrounds and levels.

INTRODUCTION  
TO EXPLOSIVES

Chemistry

Detonation & Shock

Applications

Detection & IED's

Instrumentation

**Course Director: Dr. Jimmie Oxley**, Professor of Chemistry & Co-Director of Forensic Science Partnership, University of Rhode Island, Kingston, RI; joxley@chm.uri.edu (401) 874-2103

### Chemistry

Chemical makeup of explosives—minimum requirements to be an explosive & synthetic principles. Initiation of explosives—role of hot spots, critical diameter & detonation failure. Evaluation—strength and safety.

### Detonation & Shock Wave Physics

Shock and detonation waves. CJ & ZND models of detonation. Fundamentals of elastic waves. Shocks in solids. Spall & fracture. Shock growth & decay. Graphical solution of plane-shock transmission.

### Applications

Military, mining, construction, metal shaping & cutting—matching requirements to applications. Overview of initiation systems. Gurney model, Code capabilities, Blast mitigation, Fragmentation

### Detection & IED's

Critique of the various technologies used in forensics and airport screening -- bulk and trace. New challenges to detection. Laboratory analysis

### Instrumentation

Survey of diagnostic techniques, from the most common to the most recent. Basic principles and examples of evaluation of explosive performance and effects.

## COURSE INSTRUCTORS

**Dr. James Kennedy**, Researcher, Los Alamos National Laboratory, Los Alamos, New Mexico.

**Dr. Jimmie Carol Oxley**, Professor Chemistry, co-Director Forensic Science; U of Rhode Island.

**Dr. Vilem Petr**, Assistant Research Professor, Mining Engineering Dept, Colorado School of Mines.

**Dr. Maurice Marshall**, OBE, Assistant Director, Materials Technology; Ministry of Defence, UK.

**Dr. Keith Thomas**, Researcher, Los Alamos National Laboratory, Los Alamos, New Mexico.

## REGISTRATION FEE

The registration fee of (US) \$1200 includes the course materials, coffee breaks, a reception and 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 five (5) working days before the course starts.

## LODGING

Registrants must make their own travel & lodging arrangements. Cite meeting code 26433 for negotiated rate of \$75 per night at Village Inn hotel 401-783-6767. (This is also the hotel where the banquet will be held.) Rate is good until May 2, 2005.

For more information, visit  
[www.chm.uri.edu/forensics](http://www.chm.uri.edu/forensics)

**Introduction to  
Explosives Chemistry & Physics  
May 10-12, 2005**

Name \_\_\_\_\_

Title \_\_\_\_\_

Affiliation \_\_\_\_\_

Phone \_\_\_\_\_ Fax \_\_\_\_\_

E-Mail \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

Zip \_\_\_\_\_ Date \_\_\_\_\_

**Registration Fee: \$1200(US)  
must accompany registration form**

**Make checks payable to:**

University of Rhode Island,  
Chemistry Dept.

**Mail Payment and Registration to:**

University of Rhode Island  
Chemistry Dept  
*Attn: Jimmie Oxley*  
Kingston, RI 02881

Phone/fax (401) 874-2103  
[joxley@chm.uri.edu](mailto:joxley@chm.uri.edu)

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

U of Rhode Island  
Chemistry Dept  
51 Lower College Rd  
Kingston, RI 02881

# INTRODUCTION TO EXPLOSIVES

## SHORT COURSE ON CHEMICAL & PHYSICAL PRINCIPLES



**May 10-12, 2005**

**Kingston, RI**

*Presented by:*



**University of Rhode  
Island, Chemistry &  
Forensic Science**

**&**



**Colorado School of Mine  
Mining Engineering Dep<sup>t</sup>**

**&**



**Hazards & Explosives  
Research & Education**