


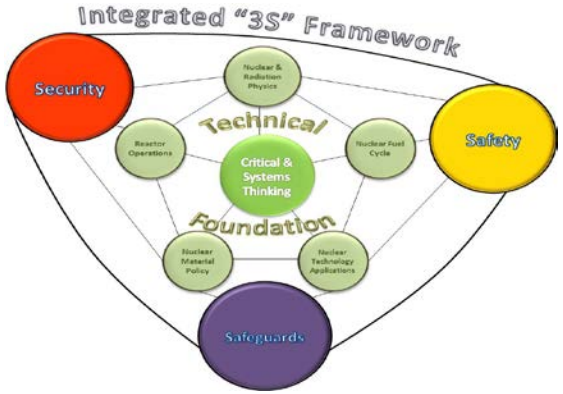


# *The Gulf Nuclear Energy Infrastructure Institute (GNEII) Four Years On*

**IAEA Conference on Human Resource Development for Nuclear Power Programmes: Building and Sustaining Capacity**
*Vienna, Austria*
*May 13, 2014*

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# Introduction

## What is GNEII?

- Regionally based Institution
  - human resource capability
  - Future decision makers
    - managers & regulators
- Education & Development
  - Nuclear energy infrastructure
  - Integrated safeguards, safety, and security (3S)
  - Nuclear power fundamentals
- Strategic effort
  - Coordinated partnership
  - Responsible national nuclear energy program
  - Regional context

## Why GNEII?

- Build indigenous human resources
  - Education, Research, Technical capacity
  - Integrated 3S Systems Approach *-coupled with-* Nuclear Energy Infrastructure
- GNEII Addresses a Need
  - Increased nuclear power demand
  - Regional Nuclear Infrastructure
    - GNEII is a sustainable mechanism for developing a responsible nuclear energy program

# GNEII is a Strategic Partnership

UAE Partners

- Sponsorship & implementation
  - Khalifa University of Science, Technology and Research
- Support from
  - Federal Authority for Nuclear Regulation (FANR)
  - Emirates Nuclear Energy Corporation (ENEC)
  - Critical Infrastructure and Coastal Protection Authority (CICPA)

US Partners

- Sponsorship
  - DOE/NNSA – International Nuclear Security Program (INS)
  - DOS/CTR – Partnership for Nuclear Security (PNS)
- Implementation
  - Sandia National Laboratories (SNL)
  - Texas A&M University (TAMU) Nuclear Security Science and Policy Institute

# History

- Initial Discussions
- International Consultations
- Regional Scoping Trip

**2009**

**2010 -2011**

- Letter of Intent
- Memorandum of Understanding
- GNEII Pilot Course
- International Conferences

- Fundamentals Course
- International Conferences
- GNEII Symposium

**2012 -2014**

# Educational Philosophy

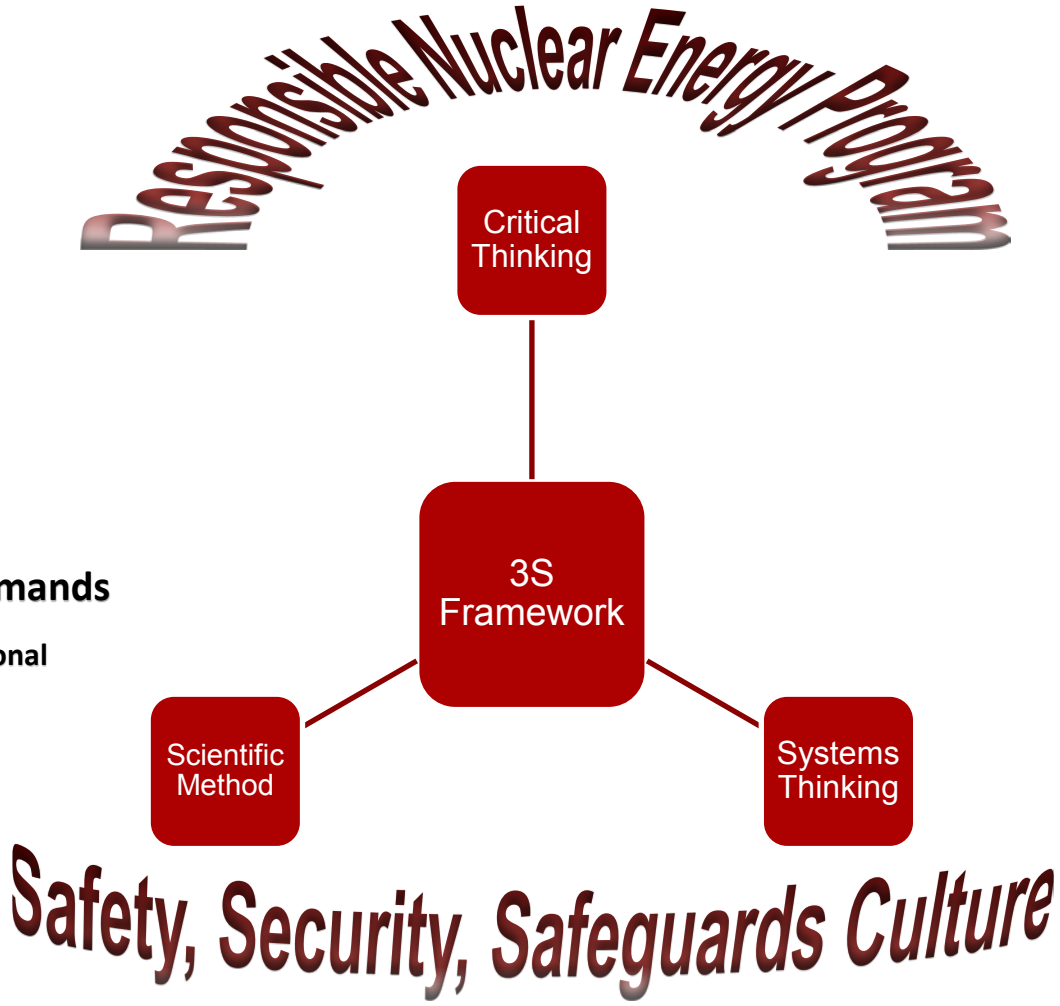
**Safety, Security, Safeguards Culture**

**Integrated 3S Framework**

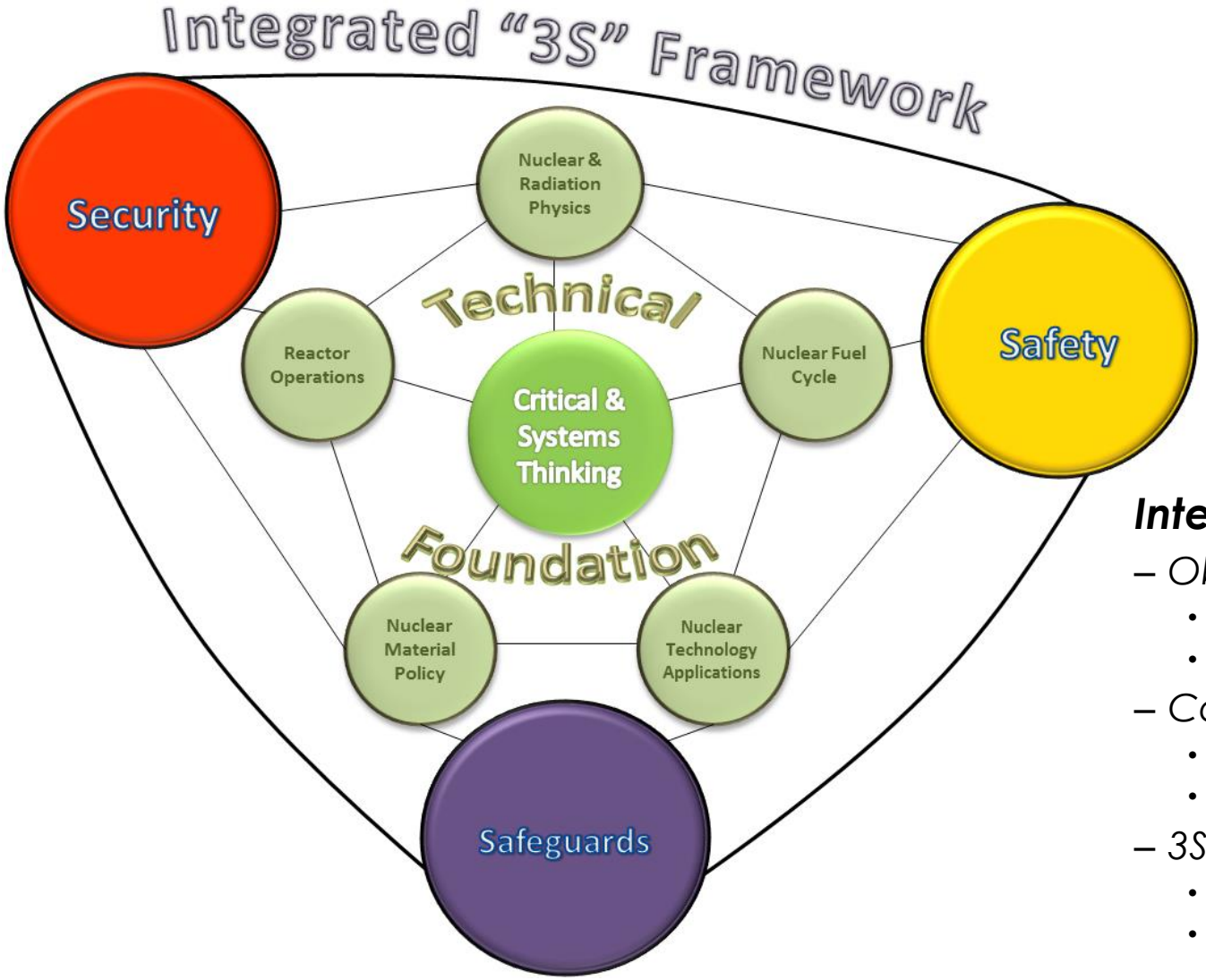
- **Critical Thinking**
- **Scientific Method**
- **Systems Thinking & Approach**

**Responsible Nuclear Energy Program**

- **Balance & Optimize Needs & Demands**
  - **Technical, Social, National, International**



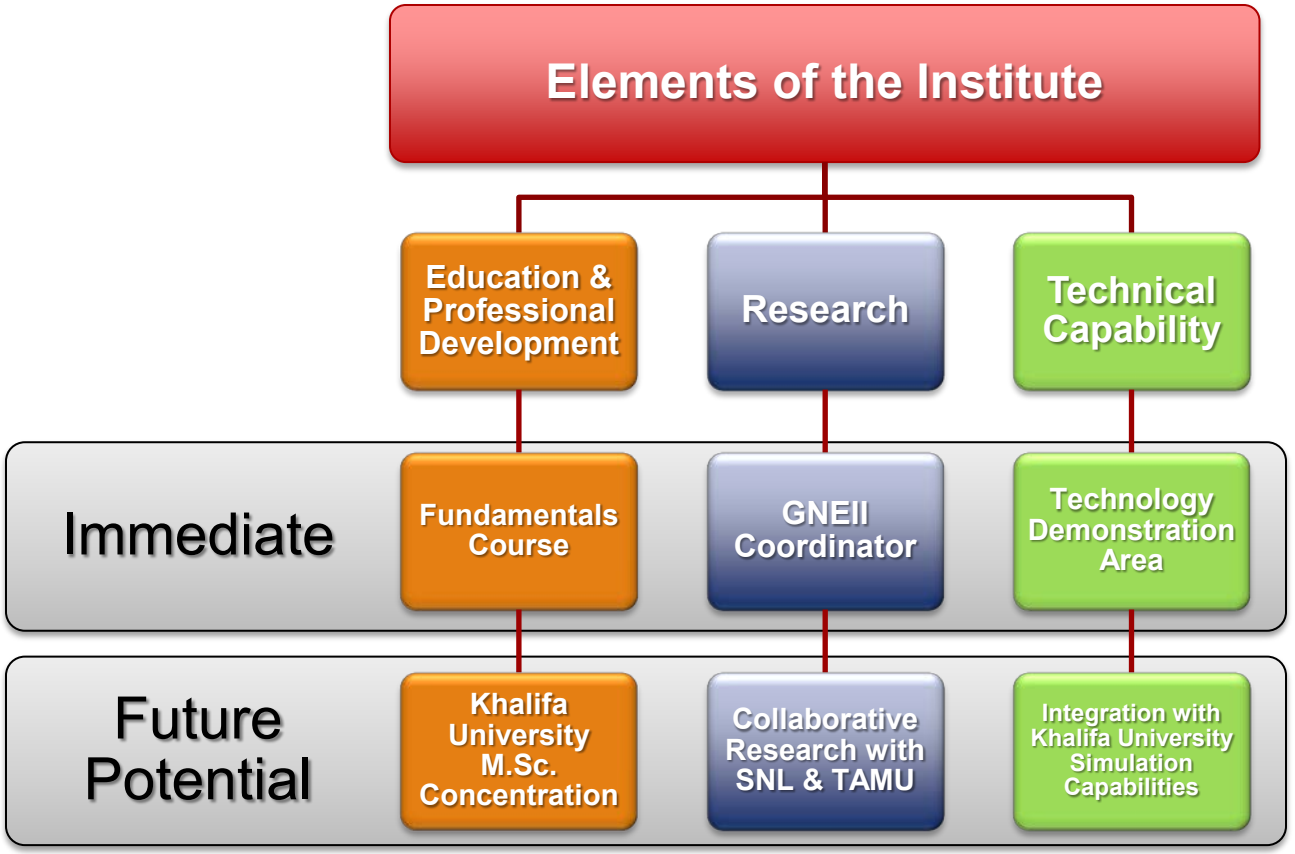
# 3S Curriculum




***Integrated 3S***

- *Objectives*
  - *Technical*
  - *Operational*
- *Components*
  - *Technical*
  - *Operational*
- *3S Interactions*
  - *Direct*
  - *Indirect*

# GNEII's Three Pillars



# Education

## *GNEII Fundamentals Course*

### Nuclear Energy Technical Foundations

- **Critical Thinking, Systems Approach, Physical Foundations, Nuclear Fuel Cycle**

### Nonproliferation, Safeguards, Safety & Security

- **International Nonproliferation Regime, International Safeguards, Safety Culture and Risk Analysis, Physical Protection and Security Culture, 3S Interactions**

### Capstone Research

- **Educational and intellectual foundation for conducting independent research**
- **Bridges GNEII's *Education* and *Research* elements**

# Education

| GNEII 2014 Fundamentals Course Curriculum | |
|---|---|
| 9-Feb *Week 1* | Intro, 3S, Critical & System Thinking, Scientific Method, Need for Nuclear, History, Components, Economics, Applications |
| 16-Feb *Week 2* | Nuclear & Radiation Physics, Neutron Interactions, Reactor Operations, Radiation Effects, Operating Modes |
| 23-Feb *Week 3* | Power Plant Systems, Fuel Cycle, Nonproliferation Efforts & Policy |
| 2-Mar *Week 4* – 9-Mar *Week 5* | **SAFEGUARDS (2 weeks)** State System of Accountancy Controls, Non-Destructive and Destructive Analysis, Bulk and Item Facilities |
| 16-Apr *Week 6* – 23-Apr *Week 7* | **SECURITY (2 weeks)** Probabilistic Risk Assessment, Security Culture, Physical Protection Systems, Detect, Delay, Respond, Evaluate |
| 30-Apr *Week 8* | Independent Capstone Research |
| 6-Apr *Week 9* – 13-Apr *Week 10* | **SAFETY (2 weeks)** Safety Culture, Engineered Safety Features, Emergency Response Planning, Radiation Safety |
| 20 -Apr *Week 11* – 27-Apr *Week 12* | Capstone Research & Preparation (3 weeks) |
| 4-May *Week 13* – 11-May *Week 14* | Capstone Preparation & Dry Runs |
| 18-19 May | SYMPOSIUM: Capstone Presentations & Certificates |

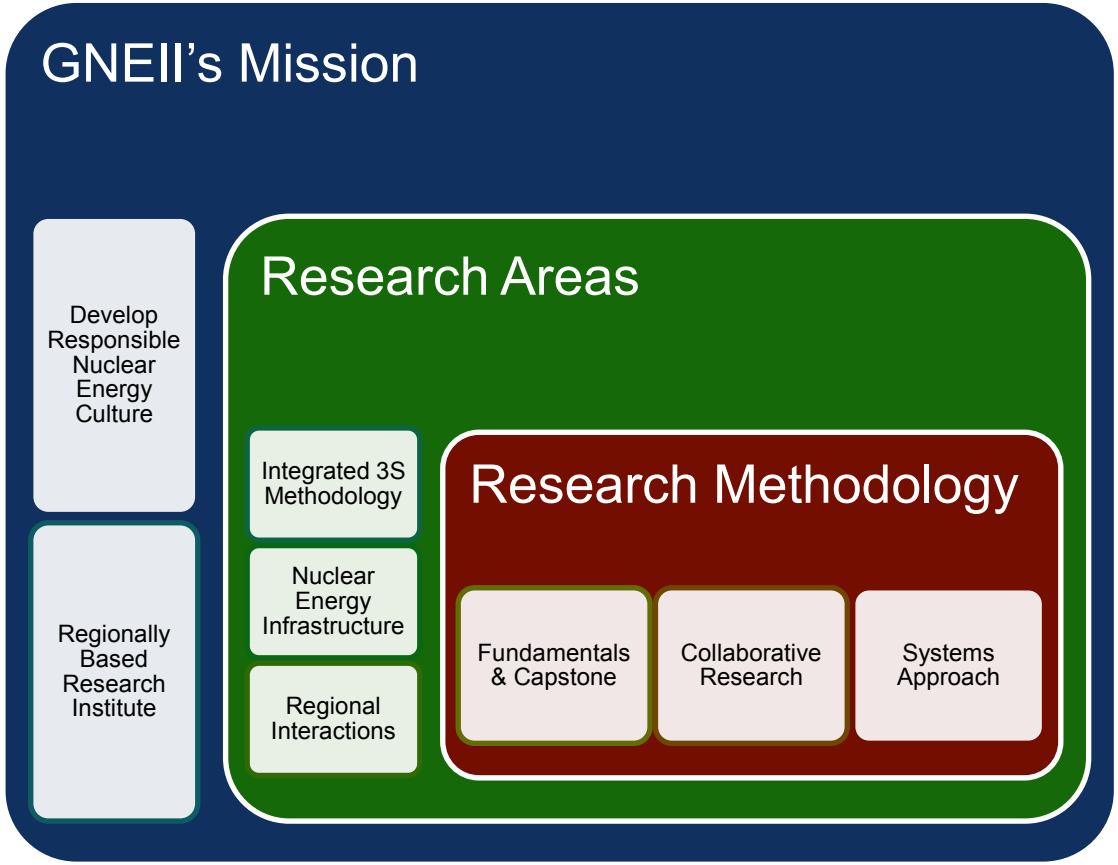
# Research

## *Capstone Research Projects*

- Independent Research
- Applied 3S Approach

## *Collaborative Research*

- Stakeholders, Partners, Implementers
- Common Issues & Concerns
- Regional Perspectives



# Technical Capability

## *Technology Demonstration Area*

- Hands-on equipment
  - Radiation monitors, detectors, etc.
- 3S Laboratory

## *Nuclear Engineering at Khalifa University*

- Radiation Sciences Lab
- Reactor Analysis & Simulation Lab
- Environmental Radiation Lab

Environmental Radiation Lab

Radiation Sciences Lab

Reactor Analysis, Design and Instrumentation Controls Lab

# شكراً

*Thank you!*

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