Lectures for the course: Information and System Security (IT 60112)

Week 1

Lecture 1 – 06/01/2016

• Introduction to the course
• Confidentiality, integrity and availability
• Evaluation Guidelines
• Term paper and Term project guidelines

Lecture 2 – 07/01/2016

• Threats
• Policy and mechanism
• Assumptions and trust
• Assurance
• Goals of security
• Operational issues
• People issues

Lecture 3 – 08/01/2016

• Protection systems
• Access control matrix
• Own right, copy right

Week 2

Lecture 4 – 13/01/2016

• HRU model

Lecture 5 – 14/01/2016

• State transition in HRU model
• Leakage of right

Lecture 6 – 15/01/2016

• Safety in HRU model
• Take grant protection model
Week 3

Lecture 7 – 20/01/2016
- Analysis of take grant protection model

Lecture 8 – 21/01/2016
- Bell-LaPadula Model

Week 4

Lecture 9 – 27/01/2016
- Biba Integrity model
- Lipner integrity model

Lecture 10 – 28/01/2016
- Clark-Wilson Model

Lecture 11 – 29/01/2016
- Clark-Wilson Model
- Separation of duty
- Auditing
- Chinese Wall security policy

Week 5

Lecture 12 – 03/02/2016
- Class test held

Lecture 13 – 04/02/2016
- Authentication
- Password based
- Dictionary attack type 1

Lecture 14 – 29/01/2016
- Dictionary attack type 2
- Pass algorithm
- Challenge-response
- S/Key one-time password

**Week 5**

**Lecture 15 – 11/02/2016**
- Introduction to Kerberos

**Lecture 16 – 11/02/2016 (compensatory)**
- Kerberos
- Multiple Kerberos realms

**Lecture 17 – 12/02/2016**
- Class test script shown and feedback given

**Week 6**

Mid sem exam held

**Week 7**

**Lecture 18 – 24/02/2016**
- Secure system design principles

**Lecture 19 – 25/02/2016**
- Introduction to RBAC

**Lecture 20 – 26/02/2016**
- RBAC0, RBAC1, RBAC2
- Mid-sem scripts shown and feedback given

**Week 8**

**Lecture 21 – 02/03/2016**
- Constraints in RBAC
- RBAC3
- SoD, Cardinality and Pre-requisite constraints
- SMER
Lecture 22 – 03/03/2016

- Administrative RBAC
- Security analysis in RBAC
- Introduction to role mining

Lecture 23 – 04/03/2016

- Basic RMP
- Delta-approx. RMP

Week 9

Lecture 24 – 09/03/2016

- Min-noise RMP
- Problem class of Basic-RMP
- Database tiling approach for solving Basic RMP

Lecture 25 – 10/03/2016

- Minimum Biclique Cover based approach for solving Basic RMP

Lecture 26 – 11/03/2016

- Temporal RBAC
- Periodic expressions
- Event expressions
- Periodic events
- Role enabling base

Week 10

Lecture 27 – 16/03/2016

- TRMP
- Role trigger
- Blocked events
- Brief introduction to ABAC
- New research directions in access control

Lecture 28 – 17/03/2016

- Assurance
- Informal, semi-formal and formal methods in assurance
- Effort estimate of software/security products

**Lecture 29 – 18/03/2016**

- Cost estimate
- Peer review

**Week 11**

**Lecture 30 – 23/03/2016**

- Peer review
- Metrics – Review effectiveness, Defect leakage and Productivity

**Week 12**

**Lecture 31 – 30/03/2016**

- Requirements traceability
- Configuration management
- Internal audit

**Lecture 32 – 31/03/2016**

- Formal methods for assurance
- Basics of model checking
- CTL

**Lecture 33 – 01/04/2016**

- Formal assurance techniques continued and concluded

**Week 13**

**Lecture 34 – 06/04/2016**

- Evaluating systems
- TCSEC
- ITSEC

**Lecture 35 – 07/04/2016**

- Common criteria
- Intrusion detection systems
Lecture 36 – 08/04/2016

• Different types of IDS
• Anomaly detection

Week 14

Lecture 37 – 11/04/2016

• Demo of security analysis using Alloy
• Base rate fallacy and intrusion detection
• Sample problem solved

Lecture 38 – 12/04/2016

• Course summary