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

**Week 1**

**Lecture 1 – 06/01/2017**

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

**Week 2**

**Lecture 2 – 11/01/2017**

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

**Lecture 3 – 12/01/2017**

- Protection systems
- Access control matrix
- Access control by Boolean expression evaluation

**Lecture 4 – 13/01/2017**

- Own right, copy right
- HRU model

**Week 3**

**Lecture 5 – 18/01/2017**

- State transition in HRU model

**Lecture 6 – 19/01/2017**

- State transition in HRU model
- Leakage of right
• Safety in HRU model
• Undecidability result

Lecture 7 – 20/01/2017
• HRU Model - conclusions
• Take Grant protection model

Week 4
Lecture 8 – 25/01/2017
• Safety in TGP

Lecture 9 – 27/01/2017
• TGP – Summary
• Bell-LaPadula Model

Week 5
Lecture 10 – 01/02/2017
• Bell-LaPadula Model

Lecture 11 – 02/02/2017
• Biba’s model
• Lipner’s model

Lecture 12 – 03/02/2017
• Class test held

Week 6
Lecture 13 – 08/02/2017
• Lipner’s model
• Clark-Wilson’s model

Lecture 14 – 09/02/2017
• Chinese Wall security policy
• Class test scripts shown and feedback given
Week 7

- Mid sem exam held

Week 8

Lecture 15 – 22/02/2017

- Authentication
- Password based authentication
- Dictionary attacks

Lecture 16 – 23/02/2017

- CAPTCHAs
- One time passwords

Lecture 17 – 24/02/2017

- Kerberos

Week 9

Lecture 18 – 01/03/2017

- Kerberos realms and multiple kerberi
- Secure system design principles

Lecture 19 – 02/03/2017

- Secure system design principles
- Mid sem scripts shown and feedback given

Lecture 20 – 03/03/2017

- RBAC
- RBAC0, 1, 2, 3

Week 10

Lecture 21 – 06/03/2017

- ARBAC
• Introduction to role mining

Lecture 22 – 08/03/2017
• Role mining problems
• Basic RMP, Delta-approx. RMP, Min-noise RMP

Lecture 23 – 09/03/2017
• Database tiling for solving Basic RMP
• MBC approach for solving Basic RMP

Lecture 24 – 10/03/2017
• Temporal RBAC

Week 11

Lecture 25 – 15/03/2017
• TRBAC
• Other extensions of RBAC
• Research problems in RBAC and its variants

Lecture 26 – 16/03/2017
• Attribute based Access Control

Lecture 27 – 17/03/2017
• Assurance
• Informal, semi-formal and formal methods for assurance

Week 12

Lecture 28 – 22/03/2017
• Effort and cost estimate
• Productivity
• Fixed cost vs T&M basis projects

Lecture 29 – 23/03/2017
• Peer review
• Code walkthrough
• Other different types of metrics
• Configuration management
• Productivity
• Internal audit and external audit

**Lecture 30 – 24/03/2017**

• Requirements traceability
• Defect leakage

**Week 13**

**Lecture 31 – 29/03/2017**

• Formal methods of assurance

**Lecture 32 – 30/03/2017**

• Demo of RBAC security analysis using Alloy

**Lecture 33 – 31/03/2017**

• Evaluating systems
• General Methodology
• TCSEC

**Week 14**

**Lecture 34 – 03/04/2017 (Extra class)**

• Tutorial

**Lecture 35 – 05/04/2017**

• ITSEC
• CC

**Lecture 36 – 06/04/2017**

• Intrusion detection systems
• NIDS, HIDS, DIDS, AppIDS
• Misuse detection
• Anomaly based IDS
Lecture 37 – 07/04/2017

- Anomaly based IDS
- Base rate fallacy
- Course Summary

Week 15

Lecture 38 – 12/04/2017

- Tutorial

Lecture 39 – 13/04/2017

- Tutorial