

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