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

Week 1

Lecture 1 – 02/01/2014

- Introduction to the course
- Evaluation Guidelines
- Term paper and Term project guidelines

Lecture 2+3 – 03/01/2014

- Confidentiality, Integrity and Availability
- Threats and Attacks
- Policy and Mechanism
- Goals of Security
- Assumptions and Trust

Week 2

Lecture 4 – 08/01/2014

- Assurance
- Operational issues
- Human issues
- Access Control Matrix
- Access control by Boolean expression evaluation
- Owning and copying of rights, Copy flag

Week 3

Lecture 5 – 15/01/2014

- Representing system state using Access control matrix
- HRU model components

Lecture 6 – 16/01/2014

- Primitive operations
- State transition in HRU
- Leakage of rights
- Safety in HRU

Lecture 7+8 – 17/01/2014

- Recap of HRU model
- Take grant protection model
- Graph re-writing rules
- Safety is TGP
- Sharing of rights in subject-connected paths

Week 4

Lecture 9 – 22/01/2014

- Sharing of rights in subject-object graphs
- Properties of TGP model

Lecture 10 – 23/01/2014

- Confidentiality policies
- Bell-LaPadula model
- Introduction to integrity policies
- Biba's model

Week 5

Lecture 11 – 29/01/2014

- Biba's Models
- Lipner's Model

Lecture 12 – 30/01/2014

- Clark Wilson model

Lecture 13+14 – 31/01/2014

- Chinese Wall Model
- Tutorial on HRU and TGP

Week 6

Lecture 15 – 05/02/2014

- Authentication
- Passwords
- User selectable and machine generated
- Pronounceable passwords
- Dictionary attack type 1

- Pass algorithms
- Ageing of passwords
- Challenge response

Lecture 16 – 06/02/2014

- Dictionary attack type 2
- S/Key one-time password scheme

Lecture 17+18 – 07/02/2014

- Class test 1 held

Week 7

Lecture 19 – 12/02/2014

- Kerberos

Lecture 20 – 13/02/2014

- Kerberos contd.
- Kerberos realms and multiple Kerberi

Lecture 21 – 14/02/2014

- Class test scripts shown and feedback given

Week 8

- Mid sem exam held

Week 9

Lecture 22 – 27/02/2014

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

Lecture 23+24 – 28/02/2014

- Role Based Access Control
- RBAC0, 1, 2 and 3

Week 10

Lecture 25 – 05/03/2014

- Administrative RBAC
- Can_assign, can_revoke, can_assignp, can_revokep and can_modify
- Security analysis for RBAC in presence of admin model

Lecture 26 – 06/03/2014

- Role mining
- Basic RMP, Delta-approx RMP and Min-noise RMP

Lecture 27 – 07/03/2014

- Database tiling approach for solving Basic RMP

Week 11

Lecture 28 – 12/03/2014

- Minimum biclique cover approach to role mining

Lecture 29 – 13/03/2014

- Detailed discussion of minimum biclique cover approach
- Other variants of role mining as research directions

Lecture 30 – 14/03/2014

- Temporal, spatial and spatio-temporal extensions to RBAC
- TRBAC
- Periodic expressions

Week 12

Lecture 31 – 19/03/2014

- Pi and Sol functions
- Periodic event expressions
- Run time requests
- REB
- Periodic event, Role trigger
- Role status expressions
- Blocked and non-blocked events
- New research directions in temporal and spatial RBAC

Lecture 32 – 20/03/2014

- Assurance
- Pre-proposal estimation

Lecture 33+34 – 21/03/2014

- FP analysis
- Productivity and cost per person month
- Fixed cost and T&M basis project
- Formal, semi-formal and informal techniques for assurance