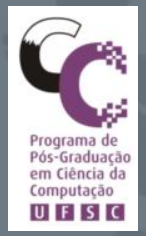
# Lecture Plan Overview

## Design and Verification of Security Protocols and Security Ceremonies

Programa de Pós-Graduacão em Ciências da Computacão
Dr. Jean Everson Martina

March-June 2019




UNIVERSIDADE FEDERAL
DE SANTA CATARINA

# Course Identification

- INE 410128 - Design and Verification of Security Protocols and Security Ceremonies

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- 3 credits – 45 hours

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# About the Lecturer

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- M.Sc. In CompSci;
- Ph.D. In CompSci;
- Several International Projects;
- Working on Cryptography, Digital Signatures, Security Protocols and Security Ceremonies.

# About the Students

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- Your Name and Affiliation;

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- Prior knowledge on Security;
- Anything else you believe is important to share.

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- Some prior familiarity with formal methods may be helpful;
- All necessary background will be covered in class.

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- Classical Protocols;
- Threat Modelling;
- Protocol Verification Techniques;
- Advanced Security Protocols;
- Advanced Security Ceremonies;
- Formal Verification of Security Protocols and Security Ceremonies.

# General Objective

Understand the concepts of security protocols and security ceremonies design and verification.

# Specific Objectives

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- Understand security primitives as a way of yielding security;
- Understand the relation between the different security properties and their compositions;
- Review classical security protocols;
- Understand the different threat models available for symbolic evaluation of security protocols and security ceremonies;

# Specific Objectives

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- Understand the security verification techniques available today;
- Study advanced security protocols;
- Study advanced security ceremonies;
- Be able to apply formal verification techniques based on theorem provers on security protocols and security ceremonies.

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- The first part of the course will survey contemporary security protocols and their properties, including confidentiality, authentication, secure group communication, privacy, and anonymity.

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- We will also cover cryptographic primitives, as well as standard formal models and tools used for mechanized verification of secure systems.

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- Coming up with a security specification for a particular system and performing a detailed analysis of its properties; or
- Extending an existing tool or method to support analysis of a new class of security properties; or
- Conducting a theoretical study of the relationship between several models.

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- Some lectures will be open discussions regarding the topics.

# Important to Notice!

- Lectures will be given in English;

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- The student MUST HAVE A WEBCAM for all the meetings so that participation can be attested;
- All the meetings will be recorded;
- This Course follows all UFSC regulations regarding regular courses.

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- The technical report will be assessed using standard strategies used to evaluate conference papers;
- The technical report will be evaluated over their readability, adherence to the proposed topic, contribution, coherence of the experimentation conducted and the results achieved;
- Technical reports with a pass mark should be fit for submission to the main conferences in the area of security protocols, formal methods or foundations of computer security.

# Schedule

- Tuesday 13:30-16:00 (BRT)

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- International participants should be aware that:
  - Time shifts during the semester
  - Your summer time will start (usually +1 hour);
  - Brazil is already out of summer time, so no time shift for us;

# Bibliography


- Formal Correctness of Security Protocols. Bella, G.. 2007. Springer
- Threat Modelling: Designing for Security. Shostack, A.. 2014. Wiley
- Isabelle/HOL: A Proof Assistant for Higher-Order Logic. Nipkow, T. and Paulson, L.C. and Wenzel, M.. 2003. Springer Berlin Heidelberg

# Questions????

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