Unit of Study Information

Code	Unit	Evaluation Method	Mode	Session options
CSD20	Introduction to Computer Logics	Grade and Attendance	Presencial	Semestral

Workload					
TC	PC	OA	SPA	PACC	Total
3	0	3	6	0	45

- TC: Theorethic Classes (per week);
- PC: Practical Classes (per week);
- OA: Out-of-class Activities (hours per session);
- SPA: Supervised Practical Activities (classes per session);
- PACC: Practical Activities as Curricular Components (classes per session, included in OA and SPA);
- Total: total workload in hours.

Learning Outcomes

By the end of this unit, the student will be capable of:

Write well formed formulas and semantically analise these formluas using concepts of sintax and semantics from propositional and predicate classic logicsDemonstrate sequences using proof methods (deductive systems) for propositional classical logic.

Formalize and verify arguments in propositional and predicate classical logic.

List different applications of logic in computing.

Syllabus

Introduction to Computational Logic. Applications of Logic in Computing. Syntax and semantics of propositional logic. Deductive systems for propositional logic. Formalization and verification of arguments in propositional logic. Syntax and semantics of predicate logic.

Content

Order	Syllabus	Content
1	Introduction to Computational Logic. Applications of Logic in Computing.	History and Motivation of Logic and its Applications in Computing. Arguments, statements, propositions, premises, conclusions.
2	Syntax and semantics of propositional logic.	The Propositional Language. Expressing Ideas Using Formulas. Formulas and subformulas. Size of formulas. Semantics. Valuations. Satisfiability, Validity and Truth Tables. Logical consequence.
3	Deductive systems for propositional logic. Formalization and verification of arguments in propositional logic.	Study one or more deductive systems for Propositional Classical Logic: analytical tabloids, KE tabloids, natural deduction, resolution.
4	Syntax and semantics of predicate logic.	The Predicative Language. Expressing Ideas using predicate logic formulas. Quantifiers. Free and trapped variables. Constants. Functions. Predicates Model semantics.

Basic Resources

HUTH, Michael; RYAN, Mark. Lógica em ciência da computação: modelagem e argumentação sobre sistemas . 2. ed. Rio de Janeiro, RJ: LTC, 2008. x, 322 p. ISBN 9788521616108.

ALENCAR FILHO, Edgard de. Iniciação à lógica matemática. São Paulo, SP: Nobel, c1975. 203 p. ISBN 852130403X.

SILVA, Flávio Soares Corrêa da; FINGER, Marcelo; MELO, Ana Cristina Vieira de. Lógica para computação. São Paulo, SP: Thomson, 2006. x, 234 p. ISBN 8522105170.

GALLIER, Jean H. Logic for Computer Science: Foundations of Automatic Theorem Proving. 2003. Available at: <http://www.cis.upenn.edu/~jean/gbooks/logic.html>. Accessed on: 20 fev. 2009.

Aditional Resources

BARLAND, Ian; et alli. Intro to Logic. Available at: <http://cnx.org/content/col10154/latest/>. Accessed on: 01 out. 2010.

SPIVEY, Mike. The Z Notation: A Reference Manual. Prentice Hall International Series in Computer Science, 1992. Available at: <http://spivey.oriel.ox.ac.uk/~mike/zrm/>. Accessed on: 24 de fevereiro de 2011.

BRODA, Krysia; EISENBACH, Susan; KHOSHNEVISAN, Hessam; VICKERS, Steve. Reasoned Programming. Prentice-Hall, 1994. Available at: <http://www.doc.ic.ac.uk/pandora/firstyearbook.pdf>. Accessed on: 12 dez. 2008.

FAVERO, Eloi Luiz. Programação em Prolog: Uma Abordagem Prática. Available at: <http://favero.ufpa.br/>. Accessed on: 22 de fevereiro de 2011. Universidade Federal do Pará, 2006.

CONIGLIO, Marcelo; CARNIELLI, Walter A.; BIANCONI, Ricardo. Lógica e Aplicações (em andamento). Available at: <http://www.cle.unicamp.br/prof/coniglio/LIVRO.pdf>. Accessed on: 12 dez. 2008.

SOUZA, João Nunes de. Lógica para ciência da computação: fundamentos de linguagem, semântica e sistemas de dedução. Rio de Janeiro: Campus, 2002. 308 p. ISBN 85-352-1093-8