Applied Logic Concentration

Updated September 27, 2024

Symbolic Systems majors completing the new Core requirements effective for 2020-2021 must complete the following requirements to qualify for a Concentration in Applied Logic. All courses must be taken for 3 units of more. Notes: Core requirements fulfilled by a course are noted in brackets "[]". "*ASSR*" denotes courses that fulfill the Advanced Small Seminar Requirement.

Note: Courses that have been nominated and approved for requirements since the date that the list below was last updated (see note at the top for the date) are shown on the Course Nominations spreadsheet (requires a Stanford login). You can search or browse the spreadsheet to see all course nominations and whether they were approved or not.

1. ***Metalogic***.
    - PHIL 151: Metalogic (PHIL 251) [*Formal Logic*]

2. ***Computability***. One of the following:
    - PHIL 152: Computability and Logic (PHIL 251) [*Cross-Area Requirement*] or
    - CS 154: Introduction to Automata and Complexity Theory [*Theory of Computation, Cross-Area Requirement*]

3. ***Computational Approaches to Logic***. One of the following:
    - CS 151: Logic Programming [*Cross-Area Requirement*]
    - CS 157: Computational Logic [*Formal Logic*]
    - CS 257: Introduction to Automated Reasoning [Cross-Area Requirement]

4. ***Set Theory***.
    - MATH 161. Set Theory

5. ***Integrative Requirement***. Must be completed no earlier than the Junior Year:
    - Any of the *Standard Options* for all Concentrations specified under the Core Capstone requirement, or
    - A *Concentration-Specific Integrative Course* -- a course that integrates the themes of the Concentration with the Core requirements. One of the following [with more options to be added as they are approved -- some options may be removed if they are included in the list of SYMSYS 195* project courses, in order to avoid redundancy with the Standard Options]:
        - CS 151: Logic Programming [*Cross-Area Requirement*]
        - CS 163: The Practice of Theory Research
        - CS 204: Computational Law
        - CS 227B: General Game Playing
        - CS 228: Probabilistic Graphical Models: Principles and Techniques
        - CS 242: Programming Languages

- CS 254: Computational Complexity
- CS 257: Introduction to Automated Reasoning *[Cross-Area Requirement]*
- CS 281: Ethics of Artificial Intelligence [*Cross-Area Requirement]*
- CS 358A: Programming Language Foundations
- LINGUIST 130A: Introduction to Semantics and Pragmatics (LINGUIST 230A) [*Linguistic Theory, Cross-Area Requirement*]
- LINGUIST 230B: Advanced Semantics
- PHIL 154: Modal Logic (PHIL 254) [*Cross-Area Requirement*]
- PHIL 162: Philosophy of Mathematics (PHIL 262)
- PHIL 184B: Formal Epistemology (PHIL 284B) [*Advanced Philosophy, Cross-Area Requirement*]
- PHIL 351D: Measurement Theory [*ASSR*]
- PHIL 356C: Logic and Artificial Intelligence (CS 257) [*ASSR*]
- PHIL 359: Topics in Logic, Information and Agency [*ASSR*]
- PSYCH 204: Computation and Cognition: The Probabilistic Approach (CS 428) [*Cross-Area Requirement*]
- PSYCH 220A: Probabilistic models of cognition: Reasoning and Learning (CS 428A) [*Cross-Area Requirement*]
- PSYCH 293: What makes a good explanation? Psychological and philosophical perspectives (PHIL 350) [*ASSR*]

6. ***Contingent Electives***. If any of requirements 1-4 are fulfilled with courses taken for Core requirements, then additional approved Contingent Elective courses must be completed to total 5 courses beyond those that are taken for the Core. These electives can be one or more courses from any of the areas above, or which are approved for a Core requirement that the student has fulfilled with a different course, or any of the following:
    - ANTHRO 100X: "I'm Not a Robot": The Contemporary Politics of Man and Machine
    - ANTHRO 119W: Cyborg Anthropology
    - BIOE 177: Inventing the Future (DESIGN 259)
    - BIOE 273: Biodesign for Digital Health (MED 273)
    - COMM 153B: Free Speech, Democracy and the Internet (COMM 253B)
    - CS 139: Human-Centered AI
    - CS 254B: Computational Complexity II
    - CS 329X: Human Centered NLP (CS 129X)
    - EE 364A: Convex Optimization I (CME 364A)
    - EE 374: Blockchain Foundations
    - FEMGEN 147: Feminism and Technology
    - GLOBAL 124: Global Algorithmic Development and Ethics
    - LAW 807S: Policy Practicum: Innovating Privacy Protection: Tools and Strategies for California Cities
    - LINGUIST 1: Introduction to Linguistics
    - LINGUIST 230C: Advanced Topics in Semantics and Pragmatics
    - MATH 56: Proofs and Modern Mathematics
    - MATH 108: Introduction to Combinatorics and Its Applications

- MS&E 135: Networks
- MS&E 233: Game Theory, Data Science and AI
- OTOHNS 206: Augmenting Human Senses: Enhancing Perception with Technology and Bioscience
- OSPOXFRD 85: Practical Ethics for Artificial Intelligence
- PSYC 60N: The Psychology of Stoked (LIFE 60N)
- PSYC 135: Dement's Sleep and Dreams (PSYC 235)
- PSYCH 12N: Self Theories
- PSYCH 24N: Neuroforecasting
- PSYCH 144: The Sociocultural Shaping of Psychological Experience
- PUBLPOL 103F: Ethics of Truth in a Post-Truth World (PUBLPOL 203F)
- SOC 127: Solving Social Problems with Data (COMM 140X, DATASCI 154, EARTHSYS 153, ECON 163, MS&E 134, POLISCI 154, PUBLPOL 155)
- STATS 217: Introduction to Stochastic Processes I
- STS 10: Introduction to AI Safety (CS 120)
- STS 164: Ecosystems of Power: The Ethics and Influence of AI
- SYMSYS 104: Introduction to Race and Technology (ANTHRO 104D, CSRE 104)
- Additional courses may be added in the future