

**PROPOSAL OF FIELDS OF STUDY FOR THE PH.D. DEGREE**

Name: \_\_\_\_\_ UID: \_\_\_\_\_  
Last First Middle initial

Email: \_\_\_\_\_ Date: \_\_\_\_\_

**MAJOR FIELD:** \_\_\_\_\_

Course number	Course title	Instructor	(Planned) Term of completion	Grade

FIELD CHAIR : \_\_\_\_\_  
printed name signature date

**MINOR FIELD:** \_\_\_\_\_

Course number	Course title	Instructor	(Planned) Term of completion	Grade

FIELD CHAIR : \_\_\_\_\_  
printed name signature date

**MINOR FIELD:** \_\_\_\_\_

Course number	Course title	Instructor	(Planned) Term of completion	Grade

FIELD CHAIR : \_\_\_\_\_  
printed name signature date

**APPROVED**     **DENIED** (reason) \_\_\_\_\_  
PhD Advisor (printed name and signature) Date

**APPROVED**     **DENIED** (reason) \_\_\_\_\_  
Graduate Vice Chair (signature) Date

## PROPOSAL OF FIELDS GUIDELINES & PROCEDURES

1. A "Proposal of Fields" form must be submitted to the Graduate Student Affairs Office (291 Engineering VI) by the end of the second year in the PhD program. The form can be revised later if necessary.
2. A major field consists of five courses, at least three of which must be graduate courses.
3. A minor field consists of two courses, at least one of which must be a graduate course.
4. Major and minor courses must be taken for a letter grade. The student must earn a minimum GPA of 3.33 in each major and minor field.
5. **STANDARD PROPOSALS:** The following pages provide guidelines for composing major and minor proposals in established fields. If the courses in a major or a minor field proposal adhere to these guidelines, it will not require the signature of the corresponding field chair. *Established fields:* Artificial Intelligence, Computational Systems Biology, Computer System Architecture, Computer Science Theory, Information and Data Management, Network Systems, Computer Graphics and Vision, and Software Systems.
6. **PROPOSALS WITH ONE OR MORE COURSE SUBSTITUTIONS:** A major or a minor field proposal in an established field and that deviates from the standard guidelines by one or more course substitutions must be approved by the corresponding field chair (who may consult with faculty in the field). The list of current field chairs is available at the Graduate Student Affairs Office or online at [http://www.cs.ucla.edu/csd/academics/forms/field\\_chairs.pdf](http://www.cs.ucla.edu/csd/academics/forms/field_chairs.pdf)
7. **COURSE WORK TAKEN AT OTHER INSTITUTIONS:** No more than *three* equivalent or related *graduate* courses taken at other institutions may be applied towards satisfying the major or minor field requirements, subject to the following:
  - If a course taken at another institution is included in a major or minor field proposal, and falls within an established field, the proposal will be considered a deviation from the standard guidelines and must be approved by the corresponding field chair.
  - The graduate course must be taken while a graduate student.
  - The graduate course cannot have been applied towards an undergraduate degree.
8. **AD-HOC PROPOSALS:** A major or minor field proposal that does not fall in one of the established fields is considered an ad-hoc field proposal. Only one Ad hoc minor is allowed.

### GUIDELINES:

All proposals for an ad-hoc field must be approved by the department. Students are strongly encouraged to submit their ad-hoc minor proposal for approval BEFORE taking any of the proposed course.

- The ad-hoc field should be a coherent set of courses in an identifiable area (body of knowledge) that is not a subfield of the area of the major or the minors. The ad-hoc field should provide a perspective that is different from the other fields. It cannot merely be a collection of two useful classes.
- If the ad-hoc field presents some overlap with topics that are generally associated with the other fields, the justification should carefully explain why this overlap does not impinge on the value of the minor to broadening the student's Ph.D. education. (If the Academic Policy Committee [APC] finds such an overlap, the student may be required to provide more information.)

## SUBMISSION & APPROVAL PROCEDURE:

- The proposal for an ad-hoc minor must be included in a completed Proposal of Fields and must be submitted together with a detailed, written justification explaining how the proposed ad-hoc minor meets the requirements above and supports the student's research area. Include details on the two proposed classes for the minor (course description and/or course syllabus for each class).

Only one Ad hoc minor is allowed. Follow the checklist below:

1. Proposal of Fields must be completely filled out and signed off by the various field chairs prior to submitting the petition. Check with the Grad Office for field chair confirmation.
  2. Provide a memo of support/justification from your advisor.
  3. Provide an abstract of the two courses you would like approved for the proposal of fields.
    - a. Abstract should address these points.
      - i. Ad-hoc field should be a coherent set of courses in an identifiable area (body of knowledge) that is not a subfield of the area of the major or the minors thus make sure to address this issue.
      - ii. Written justification explaining how the proposed ad-hoc minor meets the requirements above and supports your research area.
      - iii. If the ad-hoc field presents some overlap with topics that are generally associated with the other fields, the justification should carefully explain why this overlap does not impinge on the value of the minor to broadening your Ph.D. education.
  4. Include your transcript and mark do not highlight the course and grade received.
  5. Send everything in a single PDF to Joseph Brown at [jbrown@cs.ucla.edu](mailto:jbrown@cs.ucla.edu). The order of the PDF items should be as follows:
    - a. Signed Proposal of Fields
    - b. Faculty Support/Justification memo
    - c. Student abstract
    - d. Unofficial Transcript with courses marked(\*) not highlighted.
    - e. PDF should be saved with your name.
- The Graduate Office will forward the proposal of fields to the Academic Policy Committee (APC). The subject line should read "Proposal for Ad-Hoc Proposal."

Approval of an ad-hoc proposal requires a majority vote of the Academic Policy Committee (APC). The APC reviews petitions once a quarter. Petitions are not reviewed in the summer. The Graduate Office, on behalf of the committee, will inform students by email when a decision is reached.

## FIELD REQUIREMENTS

### ARTIFICIAL INTELLIGENCE

A major field consists of any five of these courses, and a minor field consists of any two courses:

CS 161 CS 260 CS 261A CS 262A CS 262Z CS 263A CS 263B CS 263C CS 264A CS 267A CS 268 CS M276A  
CS 279

Fundamentals of AI

Machine Learning Algorithms

Problem Solving and Search

Reasoning with Partial Beliefs

Seminar in Causal Reasoning

Language and Thought

Connectionist Natural Language Processing Introduction to Animat Modeling

Automated Reasoning: Theory and Applications Machine Perception

Pattern Recognition and Machine Learning Visual Recognition

### COMPUTER SYSTEM ARCHITECTURE

Major field: Five courses, at least three of which must be graduate courses. Minor field: Two courses, at least one of which must be a graduate course.

Graduate courses: Any CS 25x or CS M25x course, plus CS M213A (Embedded Systems), unless the instructor explicitly wants to exclude the course from the list (since they judge that their course is not appropriate).

Undergraduate courses: CS M151B, CS 151C, CS M152B, EE 115C

### COMPUTATIONAL SYSTEMS BIOLOGY

Major field: Three core courses and a year-long seminar series course (one course credit), plus one additional graduate course, selected from the Bioinformatics or Systems Biology option areas based on the student's focus.

Minor Field: Two of the three core courses listed below. Core Courses:

1. CS M286B – Computational Systems Biology: Modeling and Simulation of Biological Systems
2. CS M221\* - (formerly Chemistry 260) Bioinformatics methods
3. A molecular and cellular biology course chosen from the following, depending on the student's background in life sciences:

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MCDB 100 MCDB C139 MCDB 144 MCDB 165A

Introduction to Cell Biology

Cell, Developmental & Molecular Neurobiology Molecular Biology

Biology of Cells

Seminars: Regular CSB series (2-3 quarters each year) to be scheduled. Currently can choose from new Bioinformatics Series or Integrative Systems Biology Series in Biomath/Molecular Pharmacology.

Course options in Bioinformatics:

CS 222  
CS 223  
CS 224  
CS 229  
CS 270A BIOMATH M271

Bioinformatics Methods II  
Statistics for Computational Biology Computational Genetics  
Current Topics in Bioinformatics  
Methods of Computational Science Statistical Methods in Computational Biology

Course Options in Systems Biology:

COMPUTER SCIENCE: CS 270A

CS M286B (Biomath M270) CS M286C  
CS 296D

ELECTRICAL ENGINEERING:

Methods of Computational Science  
Optimal Parameter Estimation & Experiment Design for Biomedical Systems Biomodeling Research and  
Research Communication Workshop Computational Cardiology

EE 131B EE 142

MATHEMATICS: MATH 151A MATH 151B

MATH 153 MATH 269B

Intro to Stochastic Processes  
Control Systems: State Space Approach

Applied Numerical Methods I  
Applied Numerical Methods II  
Numerical Methods for Partial Differential Equations Advanced Numerical Analysis

MOLECULAR, CELL, AND DEVELOPMENTAL BIOLOGY: MCDB 165B Molecular Biology of the Cell Nucleus

PHYSIOLOGICAL SCIENCE  
PHYSI 166 Animal Physiology

ECOLOGY & EVOLUTIONARY BIOLOGY

EE BIOL 170

BIOMATHEMATICS BIOMATH 220

10/9/2020

## BIOMATH M230

### Animal Environmental Physiology

Kinetic and Steady State Models in Pharmacology and Physiology Computed Tomography: Theory and Applications

## COMPUTER SCIENCE THEORY

Major field: Any five courses in the CS 28x series, provided at least two are from CS 280A, CS 280G, CS 281, CS 282A – one CS 18x course may be substituted for a CS 28x course.

Minor field: Any two courses in the CS 28x series taught by theory faculty, provided at least one course from CS 280A, CS 280G; CS 281; CS 282A - one CS 18x course may be substituted for a CS 28x course.

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## DATA SCIENCE COMPUTING

A major field is five courses, at least three of which are graduate courses. A minor field is two courses, at least one of which must be a graduate course.

For both major and minor fields, the courses must be from the following “CORE IDM” list:

### CORE IDM

CS141 CS143 CS144 CS145 CS245 CS246 CS247 CS249  
Data Science Fundamentals  
Database Systems  
Web Applications  
Introduction to Data Mining  
Big Data Analytics  
Web Information Systems  
Advanced Data Mining  
Advanced Topics in Data Structure

For a major field, at most two courses from the above core IDM list can be replaced by any of the courses from the following “ANCILLARY IDM” list. For a minor field only one of the core courses can be replaced by a course from the ANCILLARY LIST:

Computer Science  
CS 161 CS 205 CM 221 CM226 CS 230 CS 260 CS263 CS 264A CS 267A  
Fundamentals of AI  
Health Analytics  
Introduction to Bioinformatics  
Machine Learning in Bioinformatics  
Problem Solving and Search  
Machine Learning Algorithms  
Natural Language Processing  
Automated Reasoning: Theory and Applications  
Probabilistic Programming and Relational Learning

### BIO-MEDICAL PHYSICS:

BMEDPHY 210 Principles of Medical Image Processing  
BMEDPHY 214 Medical Image Processing Systems

## MANAGEMENT INFORMATION SYSTEMS (AGSM):

MGMT 272A Methods and tools for information systems design, development, and maintenance

MGMT 273A Managing the enterprise's information systems

## COMPUTER NETWORKS SYSTEMS

A major field is five courses, at least three of which are graduate courses. A minor field is two courses, at least one of which must be a graduate course. For both major and minor fields, the courses must be from the following lists:

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### GRADUATE:

CS 211

CS 212

CS 213A/B CS 214

CS 215

CS 216

CS 217A/B CS 218

CS 219\* CS 236

CS 246

Network Protocols and Systems Software design for the mobile Internet Queuing Systems Theory

Embedded Systems

Data Transmission in Computer Communications

Computer Communications and networks Distributed Multiaccess Control in Networks Advanced topics  
in Internet Research Advanced Computer Networks

Current Topics in Network Systems Computer Security

Web Information management

\*For a major field, at most two of the courses can be CS 219. If a major field proposal has two CS 219's, then they must be given by different professors.

UNDERGRADUATE:

CS 111 CS 112 CS 113 CS 117 CS 118

Operating Systems Principles

Computer Systems Modeling Fundamentals Software Engineering Introduction to Distributed Embedded systems

Computer Networks – Physical Layer

Computer Networks Fundamentals

COMPUTER GRAPHICS AND VISION

The requirements for a major field are five courses from the above lists, at least three of which are graduate courses, subject to the following:

At least one course from L2, and Two courses from L3, or

At least one course from L4

The requirements for a minor field are two courses from the above lists, both of which are graduate courses:

One course from L2, and One course from L3

Given the following lists:

L1: CS 161 Introduction to Artificial Intelligence CS 174A Introduction to Computer Graphics

L2: CS 174C/274C CS 268

CS M276A (Cross listed as STATS 231)

Computer Animation

Machine Vision

Pattern Recognition and Machine Learning

L3: CS 174B CS 269 CS 275 CS 279

Image-based Modeling and Rendering

Humanoid Character Simulation

Artificial Life for Computer Graphics and Vision

Current Topics in Computer Science Methodology: Advanced Topics in Visual Recognition

STATS 232A (to be cross listed as a CS course) STATS 232B (to be cross listed as a CS course) STATS 238

Statistical Modeling and Learning for Image Science Statistical Computing and Inference for Image Science Vision as Bayesian Inference

L4: MATH 266A/B/C MATH 273 MATH 285J

MATH 269A/B/C

10/9/2020

## SOFTWARE SYSTEMS

A major field is five courses, at least three of which are graduate courses. A minor field is two courses, at least one must be a graduate course.

For both major and minor fields, the courses must be from the following list: GRADUATE:

CS 230 CS 231 CS 232 CS 233A CS 233B CS 234 CS 235 CS 236 CS 239\*

Software Engineering

Types and Programming Languages Static Program Analysis

Parallel Programming

Verification of Concurrent Programs Computer-Aided Verification Advanced Operating Systems

Computer Security

Current Topics in Computer Science: Programming Languages and Systems

(Offered by Rajive Bagrodia, Paul Eggert, Eddie Kohler, Rupak Majumdar, Todd Millstein, Jens Palsberg, Peter Reiher.)

\*For a major field, at most two of the courses can be CS 239; and if a major field proposal has two CS 239's, they must be taken from different professors. For a minor field, at most one of the courses can be 239.

UNDERGRADUATE:

CS 111 CS 130 CS 131 CS 132 CS 133 CS 136

Operating Systems Principles Software Engineering Programming Languages

Compiler Construction

Parallel and Distributed Computing Security

## FIELD CHAIRS

AREA	FACULTY	ROOM	EMAIL	PHONE
Artificial Intelligence	Richard Korf	Eng VI 377	korf@cs.ucla.edu	206-5383
Architecture	Glenn Reinman	Eng VI 371	reinman@cs.ucla.edu	794-9755
Computational Systems Biology	Eleazar Eskin	Eng VI 286A	eeskin@cs.ucla.edu	206-4490
Data Science Computing	John Cho	3531H Boelter	cho@cs.ucla.edu	825-6735
Network Systems	Songwu Lu	Eng VI 396A	slu@cs.ucla.edu	825-4033
Software & Operating Systems	Jens Palsberg	Eng VI 86A	palsberg@cs.ucla.edu	825-4033
Theory	Alexander Sherstov	Eng VI 465	rafail@cs.ucla.edu	825-0866
Vision/Graphics	Demetri Terzopoulos	Eng VI 491A	sherstov@cs.ucl.edu	206-6946