

R·I·T

Doctor of Philosophy
COMPUTING AND INFORMATION SCIENCES

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Philosophy

Use-inspired basic research degree

**Theoretical and practical aspects of
Cyberinfrastructure (CI)** as applied to
specific problems across multiple domains

- *Double-helix paradigm*: hard-core computing technology & domain problems in business, engineering, science, and social science

Curriculum Themes

Intra-disciplinary – the 3 I's

- Infrastructure, Interaction, Informatics

- Active research areas:

- Algorithm and theory
- Artificial intelligence and machine learning
- AR/VR
- Communication and networking
- Computer vision and pattern recognition
- Data science
- Education research
- Graphics and visualization
- Human-computer interaction
- IoTs
- Mobile and pervasive computing
- Programming languages
- Security and privacy
- Software engineering
- ...

Curriculum Themes

Inter-disciplinary

- Computing to *support, facilitate, enable, and inspire* domain research
- Active domain research areas:
 - Accessibility
 - Biomedical computing and Health IT
 - Computational science
 - Computational sustainability and Green IT
 - Education informatics/technology
 - Gaming
 - Geographic information system
 - Imaging and imaging informatics
 - Natural language processing
 - Services sciences
 - Social computing
 - ...

Intra-disciplinary – 3 I's

Infrastructure

- Integration with computing systems through application
- Hardware
 - System-level design and their building block components
- Software
 - All aspects of systems and applications s/w development
- Communications
 - Sensor networks and protocols, wireless, mobile, security

Intra-disciplinary – 3 I's

Interaction

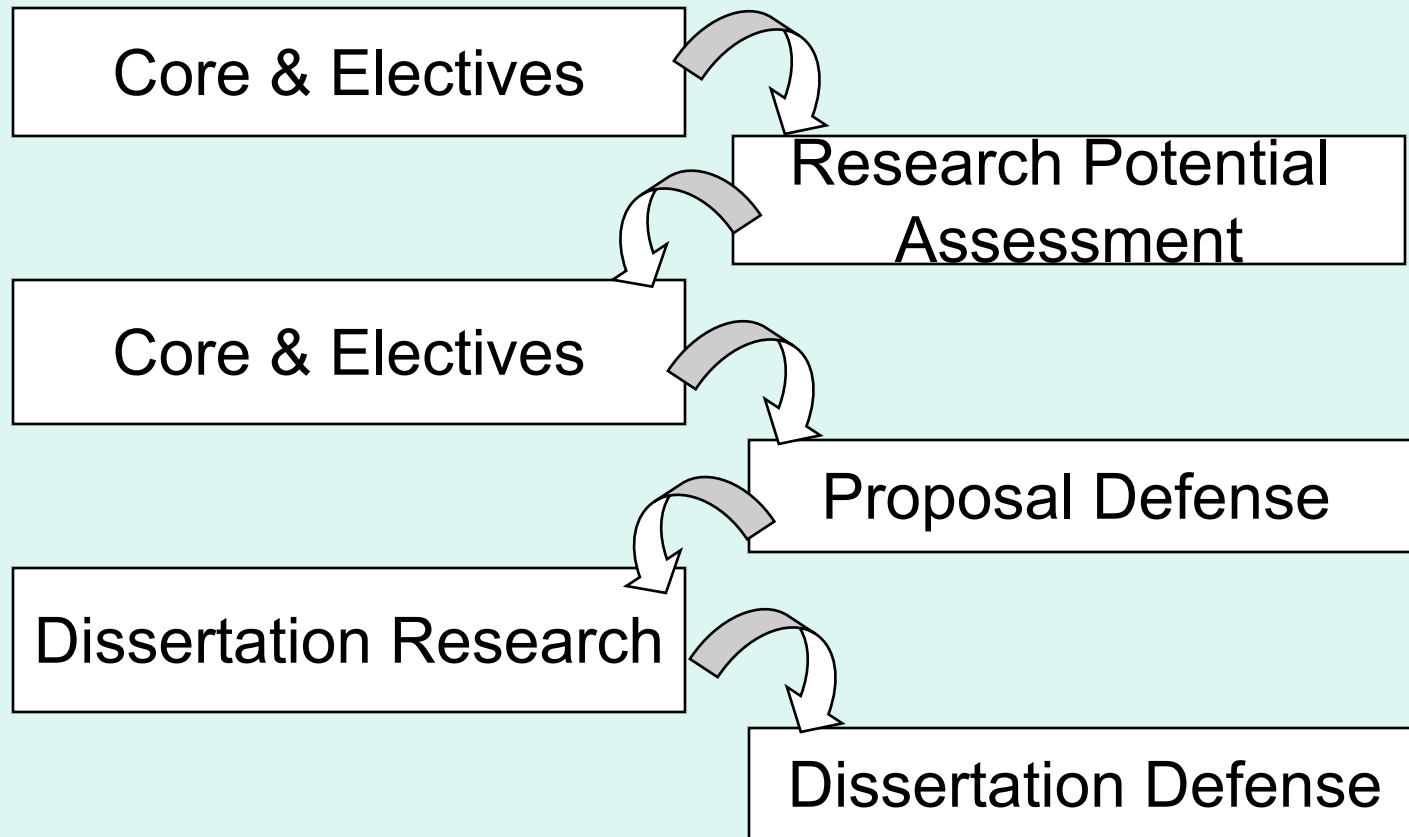
- How people and technology interact and interface
- Foundations in cognitive, social and behavioral sciences
- Understand human, social, and organizational relationships
- Engineering approach
 - Solutions based on rules and principles
 - Measurable

Intra-disciplinary – 3 I's

Informatics

- Study of computational and algorithmic techniques
- Data intensive systems
- Capture, storage, processing analysis and interpretation of data

Program of Study



Program Requirements

Total: 60 Credits

Foundation Courses: 9 Credits

Core Electives: 9 Credits

Electives: 9-18 Credits

(distribution requirement: sixty percent of the courses must be PhD courses)

Research Colloquium (first two years): 0 Credit

Teaching Skills: 2 Credits

Research and Dissertation: 22-31 Credits

Other Program Requirements

Residency: 1 year full-time study

Assessments:

- Qualifying: Research Potential (at the end of 1st year for FT)
- Candidacy: Proposal Defense
- Dissertation Defense
- (Publication Requirement)

Foundation Courses

Research Foundations

Quantitative Foundations

Cyberinfrastructure Foundations

Teaching Skills Workshop

Core I-Course Electives

To gain knowledge that represents the breadth of the computing and information sciences: one course each from the categories of Infrastructure, Interaction, and Informatics.

The candidate courses in each I-category are maintained and updated by the PhD program. They are typically more research-oriented graduate courses from the PhD program or related departments.

Other Electives

General electives may come from any graduate program, must be discussed with the PhD advisor(s) and be approved by the PhD director.

The specific number of electives will be determined by the needs for research.

Students & Graduates

- Current students: 103
 - First-year students: 20
- Graduates: 50
 - Academics: 20 (sixteen faculty, four postdocs)
 - Industry: 30
- Rankings:
 - 68th in US News doctoral program ranking (reputation)
 - 65th in CSRankings.org (top conference publications) (Oct 2nd, 2020)
 - 64th in AI
 - 25th in HCI
 - 65th in Security
 - 32nd in Software Engineering
 - 62nd in Theory

Apps Profile: 2019-2020

~220 fully reviewed

35 offers

- all full-time

- 9 declined

- 20 enrolled (6 more deferred because of COVID)

Ph.D. Program Faculty

GCCIS:

CS: Anderson, Bailey, Bazakova, Bischoff, Fluet, Geigel, Hemaspaandra, Homan, Hu, Kwon, Kumar, Liu, Mior, Nwogu, Ororbis, Radziszowski, Rafique, Raj, Reznik, Rivero, Romanowski, Zanibbi

CSEC: Bhattacharya, Hoover, Mishra, Pan, Rahbari, Wright, Yuan

IGM: Castellanos, Papangelis, Peng, Simkins, Tomaszewski

iSchool: Fan, Hanson, Heunerfauth, Oh, Peiris, Shenoy, Shinohara, Tigwell, Yacci, Q. Yu

PhD: Haake, Kong, Li, Shi, Wang

SE: DeSell, Hawker, Krutz, Meneely, Mirakhorli, Mkaouer, Newman, Sharma, Z. Yu

KGCOE: Ganguly, Kwasinski, Linte, Lopez-Alaron, Loui, Lukowiak, Markopoulos, Ptucha, Savakis, Tsouri, Yang, Zhang

COLA: Ovesdotter Alm, Zampieri

CET: Kim, Li, Nygate

COS: Cahill, Cui, Fokoue, Marchetti, Ross

NTID: Hauser, Nordhaus

Admission

Priority review date: December 31, 2020, continuous review/offer

Basic Requirements:

- Baccalaureate degree in a *broadly-defined computing-related* discipline
- Transcripts (strong record of academic achievement)
- 1-yr programming and computing concepts (advanced computing courses desirable)
- Discrete mathematics, probability and statistics (strong math background desired)

Application Process:

- Phase One: Now-Feb
 - Admission Committee: evaluation of applicants
 - PhD Director: evaluation of faculty requests
- Phase Two: Nov-Mar
 - *Match Making!*

Other Application Materials

2 letters of recommendation

Personal statement

Past works (optional)

Other Application Materials

GRE (general exam, within last 5 years)

- No minimums
 - Averages of accepted students:
 - V: 150+
 - Q: 160+
 - W: 3.5+
- Maybe waived if overall application is exceptional

TOEFL (minimum)

- Paper-based test: 570
- Internet-based test: 88
- Computer-based test: 230

Interview

Assistantships

Research and teaching

Full tuition + stipend + medical insurance

— ~\$72K

— Possible additional summer funding

Apply with application materials

How to Apply

<https://www.rit.edu/admissions/graduate#applying-for-admission>