

BIT PhD Pol C0001: BIT PhD Curriculum Strategy and Overview



(Document: BIT_PHD_Pol_C0001_V006)
(Updated 10-May-2023)

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Updates in this version (v6):

- Integrated last minor feedback before official release to students and faculty
- Broke off this policy document from the original main policy document
- Added text to introduce and explain the new strategy and program-flow figures

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1. Overview of Document

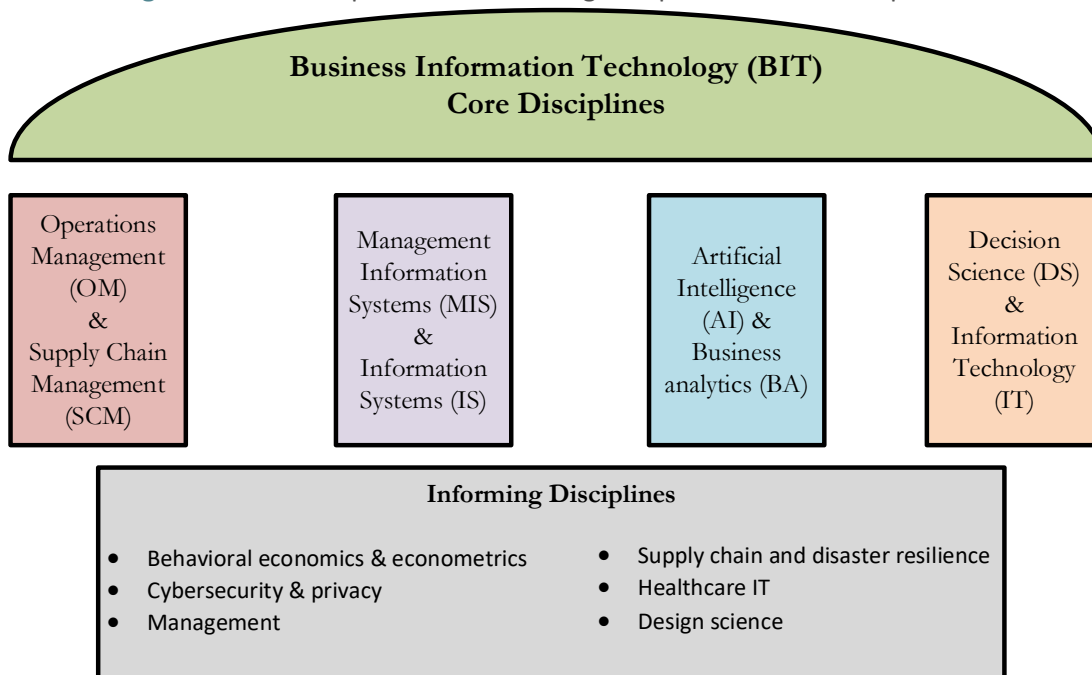
The purpose of this document is to provide an overview of Virginia Tech’s BIT PhD curriculum strategy and positioning. The audience for this document is BIT PhD students, prospective students, and recruits. This document does not provide the curriculum details on a requirements level. Instead, those details are provided in the following companion documents:

- **BIT_PHD_Pol_C0002**, which contains the curriculum policies, requirements, and seminar descriptions
- **BIT_PHD_Pol_C0003**, which details the available methods and electives
- **BIT_PHD_Pol_C0004**, which provides policies on filing the student plan of study (POS)
- **BIT_PHD_Pol_C0005**, which contains the course transfer policies and procedures

1.1. The Interdisciplinary Nature of the BIT Department and PhD Program

Crucially, the BIT department is an interdisciplinary department, built on several, related disciplines that deal with the intersection of people, organizations, process, data, and technology, as depicted in **Figure 1**. These key fields include operations management (OM), supply chain management (SCM), management information systems (MIS), information systems (IS), artificial intelligence (AI), business analytics (BA), decision science (DS), and information technology (IT). Supporting these disciplines are informing disciplines commonly embraced by various BIT faculty, including: behavioral economics and econometrics, cybersecurity and privacy, management, supply chain and disaster resilience, healthcare IT, and design science.

Figure 1. Core Disciplines and Informing Disciplines of the BIT Department



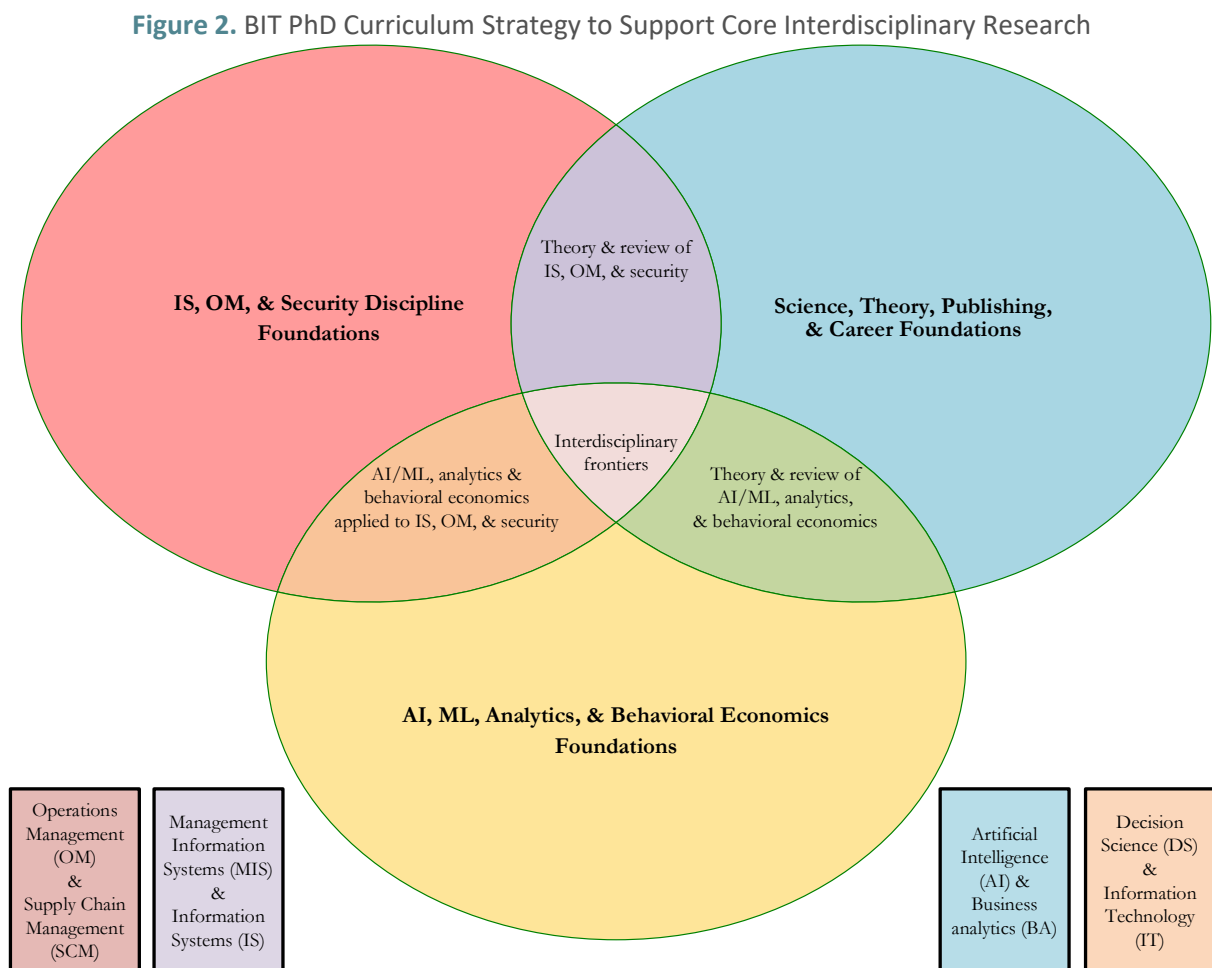
1.2. Overview of BIT PHD Curriculum Strategy and Positioning

Based on the interdisciplinary nature of the BIT department, the BIT PhD curriculum strategy and positioning is also interdisciplinary, as depicted in **Figure 2**. This Venn diagram emphasizes our curriculum design to fuse three primary areas of learning:

1. IS, OM, and security discipline foundations
2. Science, theory, publishing, and career foundations
3. AI, ML, Analytics, and behavioral economics foundations

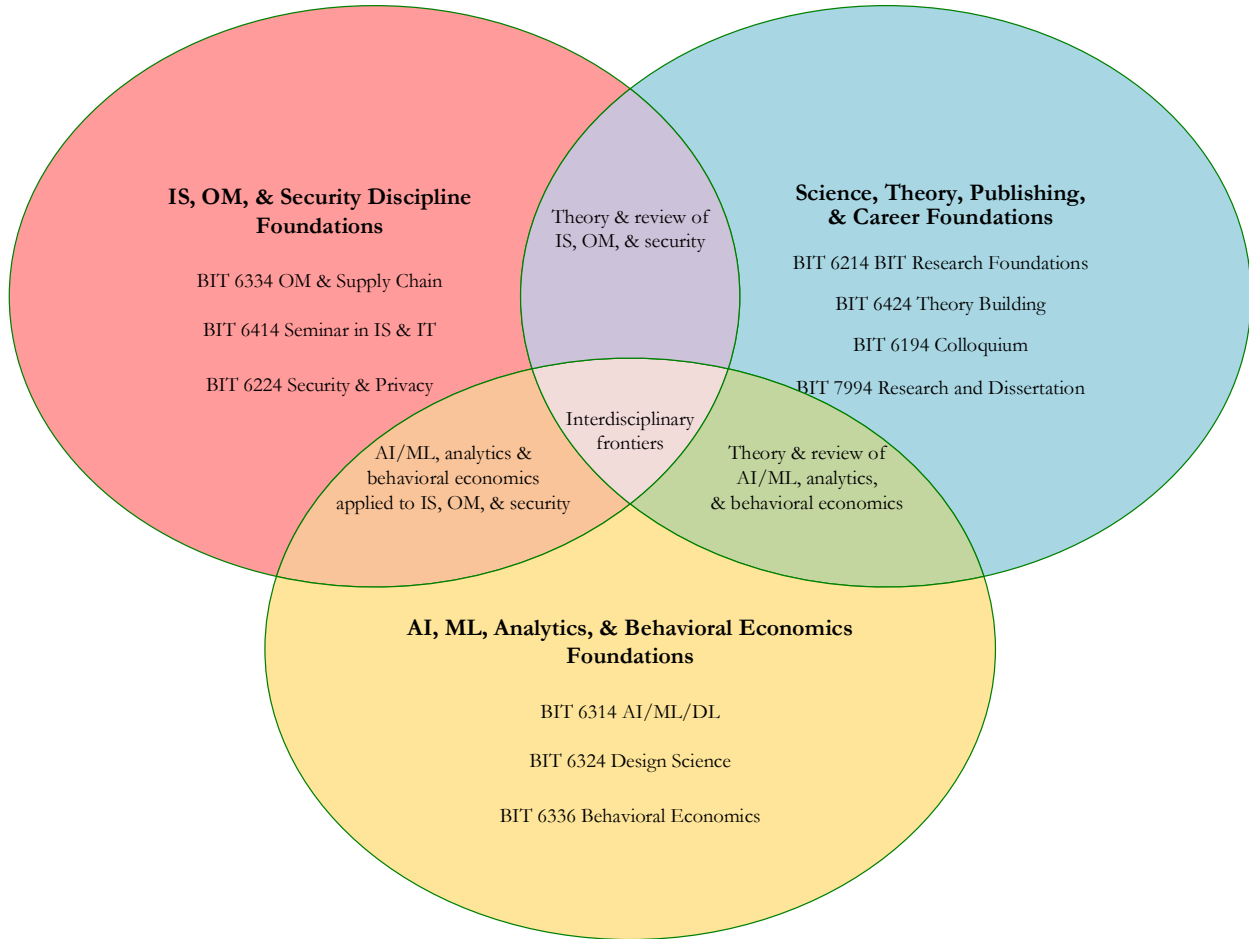
All of these three major learning objective areas are supported by our broader interdisciplinary training. As is depicted in **Figure 2**, it is these intersections that can lead to break-through combinations and ultimately to research in interdisciplinary frontiers where truly exciting research is conducted.

Importantly, the problem topics we focus on in these areas are about tackling the thorniest global problems or the **“Grand Challenges,”** whose resolution require innovative transformation of society, business, technology, and government, such as cyber threat resilience, privacy protection, disaster and supply chain resilience, sustainability (economic + social + technological + environmental), and social justice (e.g., technology access, fairness, empowerment, and equity).



Accordingly, our program curriculum is centered in **eight** interdisciplinary PhD seminars that all students must take, regardless of their focused interests, as depicted in **Figure 3**. Moreover, students are enrolled every semester until they graduate in a one (1) credit pass/fail interdisciplinary **research Colloquium**. This approach is crucial to our strategy and culture, because we cannot be truly interdisciplinary while being closed to important areas that we are not necessarily experts in. That philosophy is key to our PhD program culture and learning environment.

Figure 3. BIT PhD Curriculum Strategy Addressed by Required PHD Seminars



Thus, we offer seminars and non-graded credits to address the three major learning objectives of the program, as follows:

- 1. IS, OM, and security discipline foundations**
 - a. BIT 6334 OM & supply chain
 - b. BIT 6224 Security & privacy
 - c. BIT 6414 Seminar in IT
- 2. Science, theory, publishing, and career foundations**

- a. BIT 6424 Theory building seminar
- b. BIT 6214 BIT Foundations
- c. BIT 6194 Colloquium (1 credit p/f, every semester)
- d. BIT 7994 (Research; 18 dissertation credits)

3. AI, ML, Analytics, and behavioral economics foundations

- a. BIT 6314 AI/ML/DL seminar
- b. BIT 6324 Design science seminar
- c. BIT 6336 Behavioral economics

Adding to this curriculum foundation, we also ask students to take a **minimum of six methods courses**, where they can attain further depth in methods in four major areas of interest, as shown in **Figure 4**. The full list of possible methods courses are available in **BIT_PHD_Pol_C0003**, which also details available electives.

Figure 4. BIT PhD Required Seminars and Methods Elective Areas
Minimum 18 credits in any combination of elective methods areas

