**Cover Sheet for New Undergraduate Curriculum Proposals**

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| **Date: 4/13/2020** | **Proposal Number:**  (Assigned by the Registrar)  **Contact Person: Art Carter** |
| **Department: Information Technology** |
| **Current Course or Program ID: ITEC 453** |

**Proposal Category:** (🗸 all that apply). A separate cover sheet must be submitted for each proposal.

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| --- | --- |
| \_\_\_\_ Course Prerequisite Change | \_\_\_\_ Change to Catalog Description |
| \_\_\_\_ Course Title Change | \_\_\_\_ Minor Change to Course |
| \_\_\_\_ Course Deletion | \_\_X\_\_ New Course |
| \_\_\_\_ Course Number Change | \_\_\_\_ Program Revision |
| \_\_\_\_ Course Credit Hour Change | \_\_\_\_ New or Discontinued Program  (Major, minor, or certificate) |
| \_\_\_\_ Course Syllabus Change |  |

**Other Proposal Requirements:** (🗸 as applies and attach form)

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| **\_\_X\_\_** | For New Course Proposals, attach the New Course Proposal. |
|  | For New or Discontinued Majors or Certificates, or significant changes in program requirements contact the SCHEV liaison, the Assistant Provost for Academic Operations, to compose and attach the proposal in SCHEV format. |

**Proposal Description with Rationale:** For changes in catalog entries or syllabi, include the current language and use track changes to indicate proposed changes. Explain why the change is desired.

This course is being created to support the university’s new program in the CSAT major as part of our TTIP initiative.

**Effective Date**:

Reason for requesting an alternative effective date:

## **Approval/Recommendation Signature Sheet for Undergraduate Curriculum Proposals**

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| **Signature** | | **Title** | **Date** |
|  | | Department Curriculum Committee Chair |  |
|  | | Department Chair (on behalf of faculty) |  |
|  | | College Curriculum Committee Chair |  |
|  | | College Dean |  |
| For courses proposed to be included in the Core Curriculum: | | | |
|  | | Core Curriculum Advisory Committee Chair |  |
| For new majors and certificates: | | | |
|  | Library Liaison | |  |
| For new or discontinued majors, minors, certificates, concentrations, options or significant changes in program requirements: | | | |
|  | | Faculty Senate President following review by the Faculty Senate |  |
|  | | Provost and VP for Academic Affairs |  |
| For proposals going to BOV, SCHEV and/or SACSCOC: | | |  |
|  | | President |  |
|  | | Board of Visitors approval date |  |
|  | | SCHEV approval date |  |
|  | | SACSCOC approval date |  |
|  | | Entered into catalog by Registrar’s Office |  |

**New Course Proposal**

New course proposals originate with the Department Curriculum Committee and must be approved by the Department, the College Curriculum Committee, and the College Dean.

Proposals for Graduate level courses are forwarded to the Graduate Affairs Council for approval.

Proposals for new courses intended for inclusion in the Core Curriculum must also be approved by the Core Curriculum Advisory Committee before being presented to the College Dean.

Once fully approved, the proposal is forwarded to the Registrar’s Office/Graduate College for inclusion in the appropriate catalog.

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| Name of program: Computer Science and Technology |
| Department/School/College: Information Technology |
| Contact person – Art Carter, [aecarter@radford.edu](mailto:aecarter@radford.edu) |
| **I.** **Catalog Entry** |
| a. Prefix (three or four capital letters) ITEC |
| b. Course Number (three numbers) 453 |
| c. Course Title: **Distributed and Cloud Computing** |
| d. Prerequisites: ITEC 301 (Grade of “C” or better), ITEC 350 (Grade of “C” or better) |
| e. Credit Hours: 3 |
| f. Brief Description: The course will explore theoretical concepts and hands-on practices on distributed and cloud computing. |
| **II. Background and Justification** |
| a. Need for the Course: To support the Department’s new online program for the TTIP initiative. |
| b. Students for Whom Course is Offered: CSAT majors |
| c. Anticipated Enrollment: 30 per year |
| d. Frequency of Course Offerings: annually |
| **III.** **Rationale for Resources Required** |
| a. Faculty Resources: no additional resources required |
| b. Effect on Existing Curricula: none |
| c. Facilities, Equipment, and Supplies: none |
| d. Library Resources   1. Describe the adequacy of materials available to support this course. 2. List in priority order the additional materials to be purchased. 3. Signature of library liaison on the signature sheet |
|  |
| e. Computer Resources  We will use freely available, open-source software, and software licensed to Radford University. |
| f. Other Anticipated Resources |
| **IV. Course syllabus** – attached a course syllabus, including content described in the new course proposal instructions. |

Attach the appropriate signature page.

**ITEC 453: Distributed and Cloud Computing.**  
  
**Prerequisite: ITEC 301 (Grade of “C” or better), ITEC 350 (Grade of “C” or better)**

**Credit Hours: (3) Three hours lecture**  
  
The course will explore theoretical concepts and hands-on practices on distributed and cloud computing.

**Detailed Description of Content of Course**

Topics include:

1. Distributed System Models and Enabling Technologies
   1. System Models for Distributed and Cloud Computing
   2. Software Environments for Distributed Systems and Clouds
   3. Performance, Security, and Energy Efficiency
2. Virtual Machines and Virtualization of Clusters and Data Centers
3. Cloud Platform Architecture over Virtualized Data Centers
   1. Cloud Computing and Service Models
      1. Public, Private, and Hybrid Clouds
      2. Cloud Ecosystem and Enabling Technologies
      3. Infrastructure-as-a-Service (IaaS)
      4. Platform-as-a-Service (PaaS) and Software-as-a-Service (SaaS)
   2. Data-Center Design and Interconnection Networks
   3. Architectural Design of Compute and Storage Clouds
   4. Public Cloud Platforms: e.g., Amazon Web Service (AWS), Google Cloud, Microsoft Azure
   5. Inter-cloud Resource Management
   6. Cloud Security and Trust Management
4. Cloud Programming and Software Environments
   1. Parallel and Distributed Programming Paradigms
   2. Programming on Cloud Platform: e.g., Amazon AWS, Microsoft Azure, and Google App Engine
5. Hands-on Practices

**Detailed Description of Conduct of Course**  
  
This will be a primarily asynchronous, online course with online meetings to accompany the asynchronous modules.

**Goals and Objectives of the Course**  
  
Students who complete the course will be able to:

1. Define system models of distributed and cloud computing
2. Define virtualization of clusters and data centers
3. Describe a cloud platform architecture and essential services and features on a cloud platform
4. Understand a cloud programming platform
5. Design, develop and deploy cloud-based solutions
6. Implement core cloud services according to basic architectural best practices
7. Design and maintain network architecture for cloud services
8. Leverage tools to automate networking tasks in a cloud platform

**Assessment Measures**  
  
Student achievement will be evaluated by exams, quizzes, and assignments.  
  
  
**Other Course Information**  
  
None.  
  
  
Review and Approval  
  
September Updated

Revised: