



**ACADEMIC AFFAIRS  
COMMITTEE**

**January 21, 2022**

---

## CYBERSECURITY DATA ANALYTICS MASTER OF SCIENCE

---

**REQUEST:** Approval of a Master of Science in Cybersecurity Data Analytics offered through the Gordon Ford College of Business.

**FACTS:** The Master of Science in Cybersecurity Data Analytics program will be delivered entirely online to meet the access demand of working adults who are the primary audience for this program. According to EMSI data, there were 678,068 unique job postings for jobs with skill sets that include cybersecurity, cyber defense, cyber resilience, cyber threat intelligence, cyber security strategy, and cyber laws from January 2017 to March 2020. Concentrations in Health Care Administration, Organizational Communication, and Local Government Administrations will allow students to pursue careers in various fields or enhance their current employment. The Information Systems department where this program will be located currently offers a B.S. in Business Data Analytics and will offer two graduate certificates starting in the fall of 2021. The graduate certificates are in Data Analytics and Cybersecurity Data Analytics. The department also has a faculty member who is nationally recognized in the cybersecurity field and has published over 20 books in this area. The strength of the institution is its ability to capitalize and leverage the intellectual knowledge of faculty in Cybersecurity and Data Analytics to offer a graduate degree that will serve the region and beyond.

### **Program Core Courses (21 Hours)**

CYSA 520 Principles of Cybersecurity for Data Analytics  
CYSA 522 Cybersecurity Risk and Compliance  
CYSA 524 Cybersecurity Orchestration Using Data Analytics  
BDAN 513 Contemporary Business Analytics  
BDAN 515 Data Management  
BDAN 517 Predictive Analytics  
BDAN 519 Visualization and Decision Making

Concentration (9 hours) in Local Government Administration, Organizational Communication, or Health Care Administration

**Total Hours: 30**

**BUDGETARY IMPLICATIONS& IMPLEMENTATION DATE:** Faculty in the Department of Information Systems will teach the core courses which are integrated within the graduate certificates in Cybersecurity Data Analytics and Data Analytics. The concentrations are offered through the departments of Political Science, Communication, and Public Health as part of their graduate programs with capacity to incubate this program. Increases in enrollment may necessitate the need for hiring faculty as demand for this program increases commensurate with tuition generated by student demand.

**RECOMMENDATION:** President Timothy C. Caboni recommends approval of a Master of Science in Cybersecurity Data Analytics.

**MOTION:** Approval to establish a Master of Science in Cybersecurity Data Analytics effective Fall 2022.

# 999: CYBERSECURITY DATA ANALYTICS

## In Workflow

1. CIS Approval (ray.blankenship@wku.edu)
2. BU Dean (christopher.shook@wku.edu; evelyn.thrasher@wku.edu)
3. BU Curriculum Committee (evelyn.thrasher@wku.edu)
4. Graduate Curriculum Committee (martha.day@wku.edu; scott.arnett@wku.edu)
5. Graduate Council (martha.day@wku.edu)
6. University Senate (julie.lee@wku.edu;janet.applin@wku.edu)
7. Provost (rheanna.plemons@wku.edu; beth.laves@wku.edu)
8. Board of Regents (rheanna.plemons@wku.edu)
9. CPE (rheanna.plemons@wku.edu)
10. Program Inventory (jennifer.hammonds@wku.edu; colette.chelf@wku.edu)

## Approval Path

1. Fri, 18 Jun 2021 16:20:03 GMT  
Ray Blankenship (ray.blankenship): Approved for CIS Approval
2. Wed, 23 Jun 2021 16:05:23 GMT  
Christopher Shook (christopher.shook): Approved for BU Dean
3. Thu, 24 Jun 2021 16:36:27 GMT  
Evelyn Thrasher (evelyn.thrasher): Rollback to Initiator
4. Mon, 30 Aug 2021 17:06:43 GMT  
Ray Blankenship (ray.blankenship): Approved for CIS Approval
5. Wed, 08 Sep 2021 15:54:24 GMT  
Christopher Shook (christopher.shook): Approved for BU Dean
6. Tue, 21 Sep 2021 15:39:13 GMT  
Evelyn Thrasher (evelyn.thrasher): Approved for BU Curriculum Committee
7. Thu, 07 Oct 2021 19:43:50 GMT  
Scott Arnett (scott.arnett): Approved for Graduate Curriculum Committee
8. Tue, 12 Oct 2021 20:14:53 GMT  
Martha Day (martha.day): Approved for Graduate Council
9. Wed, 08 Dec 2021 20:53:28 GMT  
Julie Lee (julie.lee): Approved for University Senate
10. Tue, 04 Jan 2022 20:52:54 GMT  
Elizabeth Laves (beth.laves): Approved for Provost

## New Program Proposal

Date Submitted: Mon, 30 Aug 2021 17:06:21 GMT

**Viewing: 999 : Cybersecurity Data Analytics**

**Last edit: Tue, 04 Jan 2022 16:58:14 GMT**

Changes proposed by: ryb41989

### Proposed Action

Active

### Contact Person

Name	Email	Phone
Ray Blankenship	ray.blankenship@wku.edu	270-745-5952

### Term of Implementation

2022-2023

### Program Reference Number

999

### Academic Level

Graduate

### Program Type

Master's Degree

**Degree Types**

Master of Science

**Department**

Information Systems

**College**

Business

**Was your Notification of Intent (submitted to CPE by the Provost's Office) approved?**

Yes

**Program Name (eg. Biology)**

Cybersecurity Data Analytics

**Will this program have concentrations?**

Yes

**Concentrations**

- Local Government Administration
- Organizational Communication
- Healthcare Administration

**CIP Code**

43.0404 - Cybersecurity Defense Strategy/Policy.

**Will this program lead to teacher certification?**

No

**Does the proposed program contain 25% or more new content not previously taught in another course at WKU? If yes, contact the Office of the Provost for additional SACSCOC proposal requirements**

No

**Catalog Content****Program Overview (Catalog field: Overview tab)**

This program is the study of cybersecurity defenses using data analytics to support the principles of data confidentiality, integrity, and availability. In this program, students will learn to defend proactively and continuously improve the enterprise's security with an emphasis on using data analytics. Students will learn about the latest techniques in data management, data mining models, and data visualization. Students will also learn about cybersecurity policies and compliance issues from an information assurance and risk management perspective.

**Admission Requirements (Catalog field: Program Admission)****Program Admission**

Applicants must have completed an introductory statistics course and an intermediate to advanced spreadsheet course prior to enrolling in the certificate program.

Applicants are encouraged to have completed an introduction to networking course with a C-grade or better or hold a current Security + certification.

**Graduate School Admission**

Please refer to the admission section (<http://catalog.wku.edu/graduate/admission/>) of this catalog for Graduate School admission requirements.

**Curriculum Requirements (Catalog field: Program Requirements)****Program Requirements (30 hours)**

This program consists of twenty-one hours of core classes and nine hours from one of three concentrations listed below.

Code	Title	Hours
<b>Required Courses</b>		
CYSA 520	Principles of Cybersecurity for Data Analytics	3
CYSA 522	Cybersecurity Risk and Compliance	3
CYSA 524	Cybersecurity Orchestration Using Data Analytics	3

BDAN 513	Contemporary Business Analytics	3
BDAN 515	Data Management	3
BDAN 517	Predictive Analytics	3
BDAN 519	Visualization and Decision Making	3
Select a concentration		9

**Total Hours** 30

#### Local Government Administration Concentration

Code	Title	Hours
PS 526	Local Government Administration	3
PS 528	Civic Engagement and E-Governance	3

**Advisor Approved Elective** 3

PS 520	Elements of Public Administration	
PS 550	Cultural Competencies for Public Administrators	
PS 554	Cross-Sector Collaboration & Conflict	
PS 562	Public Policy Implementation & Evaluation	

**Total Hours** 9

#### Organizational Communication Concentration

Code	Title	Hours
------	-------	-------

**Advisor Approved Electives**<sup>1</sup> 9

COMM 523	Health Communication	
COMM 528	Communication in the Nonprofit Sector	
COMM 553	Health Communication Campaigns	
COMM 561	Multinational Organizational Communication	
COMM 564	Crisis Communication	
COMM 568	Communication and Organizational Identification	
COMM 571	Organizational Communication in the Digital Age	
COMM 578	Seminar in Interpersonal Communication	
COMM 581	Applied Organizational Communication	
COMM 586	Process of Group Communication	
COMM 590	Intercultural Communication	

<sup>1</sup> Not all courses will be offered online in a calendar year.

#### Health Care Administration Concentration

Code	Title	Hours
------	-------	-------

**Advisor Approved Electives** 9

HCA 540	Health Care Organization and Management	
HCA 541	Strategic Management & Marketing of Health Services	
HCA 542	Health Care Human Resources Administration	
HCA 545	Managerial Finance for Health Services	
HCA 586	Health Economics & Policy	

**Will this program be managed or owned by more than one department?**

No

### Relation to Mission and Strategic Plan

**Explain how the proposed program relates to the institutional mission and academic strategic plan.**

The proposed Master of Cybersecurity Data Analytics program addresses the following institutional and societal needs from Western Kentucky University's most recent strategic plan 2018- 2028, "Climbing to Greater Heights."

1. Bolster the stature and fiscal support of WKU's Graduate School and strengthen its external reputation.  
The Master in Cybersecurity Data Analytics program will increase the number of graduate students and generate additional revenue for the university. Students will be able to use this program to enhance their careers by choosing to stay in Kentucky or move to another part of the country.
2. Ensure that WKU students graduate with skills to think critically, solve problems, and engage effectively with others.  
The Master in Cybersecurity Data Analytics program is explicitly designed for students to think critically about data and communicate the data analysis with others.
3. Offer quality graduate programs to further lifelong learning and retraining.

The Master in Cybersecurity Data Analytics program allows students to switch to a career in Cybersecurity with minimal retraining or to build on an undergraduate degree focused on technology. This program also offers students the ability to earn two separate graduate certificates (Data Analytics & Cybersecurity Data Analytics) along with a concentration in Healthcare Administration, Organizational Communication, or Local Government Administration. These courses and concentrations were agreed upon after discussions with the program coordinators and department heads where the courses are housed.

#### **Explain how the proposed program addresses the state's postsecondary education strategic agenda**

The proposed Master Cybersecurity Data Analytics program addresses the state's postsecondary education strategic agenda as listed by specific strategies from the 2016-2021 Strategic Agenda for Postsecondary and Adult Education.

3.2. Expand the availability of flexible, affordable, competency-based postsecondary programs, as well as strategies like employer partnerships and Project Graduate, to support working-age adults in the pursuit of job-enhancing postsecondary credentials.

The Master in Cybersecurity Data Analytics program will be delivered entirely online. Concentrations in Health Care Administration, Organizational Communication, and Local Government Administrations will allow students to pursue careers in various fields or enhance their current employment.

3.3. Support efforts to improve postsecondary access, workforce readiness, and the technology infrastructure of rural Kentucky.

The Master in Cybersecurity Data Analytics program is a STEM program and will improve access by being delivered online.

9.5. Identify current and emerging workforce demands, entrepreneurial business opportunities, and stackable credentials that can lead to additional education/training.

The graduate certificates in Data Analytics and Cybersecurity Data Analytics can be used as stackable credentials for the Master in Cybersecurity Data Analytics program. The core courses for this program are the same courses used in the graduate certificates.

Once a student completes both certificates, only a nine-hour concentration will need to be completed for the master's degree.

9.6. Advance Kentucky's STEM and health agendas through ongoing leadership, advocacy, and collaboration.

Since the Master in Cybersecurity Data Analytics program is a STEM program and provides a concentration in Healthcare administration, it will advance Kentucky's STEM and health agendas.

Additionally, no such program exists in the state that concentrates on the defense of cybersecurity attacks through the use of data analytics.

### **Program Quality and Demand**

**Provide justification and evidence to support the need and demand for this proposed program. Include any data on student demand; career opportunities at the regional, state, and national level; and any changes or trends in the discipline that necessitate a new program.**

**Please insert one Learning Outcome per box. Click green plus sign for additional LO boxes**

#### **Learning Outcomes and Measurement Plan**

	<b>List all student learning outcomes of the program.</b>	<b>Measurement Plan</b>
SLO 1	Identify the fundamentals of Cybersecurity from a data analytics perspective.	The use of exams and assignments will be used to measure this SLO.
SLO 2	Apply policies, laws, and regulations in Cybersecurity.	The use of exams and assignments will be used to measure this SLO.
SLO 3	Demonstrate the ability to perform vulnerability management activities.	The use of exams and assignments will be used to measure this SLO.

**Change in Discipline (If the program is being proposed to meet changes in the academic discipline, please outline those changes and explain why they necessitate development of a new program.)**

The College of Business does not have a program that addresses the need for knowledgeable Cybersecurity employees. Combining the two graduate certificates, Cybersecurity Data Analytics and Data Analytics, this program will help meet the demand from employers as documented in the above table.

**Specify any distinctive qualities of the program.**

This program combines cybersecurity and data analytics to provide students with the skills to prevent and detect cybersecurity attacks.

**Does the proposed program differ from existing programs in terms of curriculum, focus, objectives, etc.?**

Yes

**Please explain**

This program combines cybersecurity and data analytics to provide students with the skills to prevent and detect cybersecurity attacks.

**Does the proposed program serve a different student population (i.e., students in a different geographic area, non-traditional students) from existing programs?**

No

**Is access to existing programs limited?**

No

**Describe how the proposed program will articulate with related programs in the state. It should describe the extent to which students transfer has been explored and coordinated with other institutions.**

This program is designed to be completed in one year for a full-time student. Any student transfer of courses from another institution will be handled on an individual basis.

**Describe student demand data for this program.**

The core courses for this program were initially offered in fall 2020 in the MBA program as concentrations. The concentrations are Data Analytics and Cybersecurity Data Analytics. Thirty-five students enrolled in the Data Analytics concentration and eight enrolled in the Cybersecurity Data Analytics concentration. More than seventy MBA students have since elected to pursue the Data Analytics concentration. Three students are also enrolled in the Data Analytics certificate, which is outside the MBA program. We expect demand and awareness for the core course to increase once we are allowed to advertise the graduate certificates in Fall 2021.

See the attached CPE proposal

**Will this program replace or enhance any existing program(s) or concentration(s) within an existing program?**

No

**Program Demand Data and Support Documents**

wku-cpe-proposal-MS\_CYSA-2021[3].docx

EMSI Occupation\_Overview\_20\_Occupations\_in\_United\_States\_2564.pdf

EMSI\_Job\_Posting\_Analytics\_14\_Skills\_and\_Qualifications\_in\_United\_States\_3918.pdf

## Delivery Mode

**Is 25% or more of this program offered at a location other than main campus?**

No

**Is 50% or more of this program offered by distance education (online asynchronous, online synchronous, connected classrooms, etc.)?**

Yes

**Do you plan to offer 100% of this program online?**

Yes

**Do you plan to offer 100% of this program face-to-face?**

No

**If no, enter the percentage of the program that is taught face-to-face**

0%

**Do you plan to offer at least 25% of this program as a direct assessment competency-based educational program?**

No

See the SACSCOC Policy on Direct Assessment Competency-based Educational Programs.

<https://www.sacscoc.org/pdf/081705/DirectAssessmentCompetencyBased.pdf>

## Library Resources

**Attach library resources**

LibraryResources\_Cybersecurity Data Analytics.docx

**Rationale for the program proposal?**

The Information Systems department where this program will be located currently offers a B.S. in Business Data Analytics and will offer two graduate certificates starting in the fall of 2021. The graduate certificates are in Data Analytics and Cybersecurity Data Analytics. The department also has a faculty member who is nationally recognized in the cybersecurity field and has published over 20 books in this area. The strength of the institution is its ability to capitalize and leverage the intellectual knowledge of faculty in Cybersecurity and Data Analytics to offer a graduate degree that will serve the region and beyond.

## **Budgetary Implications**

### **What are the potential budget implications for this proposal (including faculty, resources, equipment, space, etc.)?**

The MS CYSA program requires nine hours of concentration courses. The concentrations are Organizational Communication, Local Government Administration, and Healthcare Administration. Each of these concentrations can accommodate an additional five students per year. Assuming that not every student would select the same concentration, the projection is that no other faculty resources would be needed for nine hours of the program. Therefore, existing faculty in these departments would be used with no additional pay.

The remaining twenty-one hours in the program consists of courses making up the graduate Data Analytics and Cybersecurity Data Analytics certificates. These courses are also used in the MBA and Master in Accountancy and Analytics programs. The Gordon Ford College of Business is in the process of updating its required undergraduate core program of courses. These changes will allow two graduate courses to be taught as part of a normal teaching load. The department is also hiring a new faculty member this year, allowing another graduate course to be taught inload. These changes would result in only four courses that would need to be covered as an overload. The cost for the overloads for four courses is \$19,200.

Should the demand for the program exceed projections, a new faculty position would be sought in the third year if the combined demand for classes exceeds thirty students.

### **Will any additional staffing be required?**

No



A photograph of two men in business suits working in an office. One man is seated at a desk, typing on a keyboard, while the other stands behind him, looking at the screen. The scene is dimly lit with desk lamps, and the background is blurred.

# 20 Occupations in the United States

# Contents

What is Emsi Data? .....	1
Report Parameters .....	2
Executive Summary .....	3
Jobs .....	4
Compensation .....	6
Job Posting Activity .....	7
Demographics .....	12
Occupational Programs .....	14
Appendix A (Occupations) .....	16

## What is Emsi Data?

Emsi data is a hybrid dataset derived from official government sources such as the US Census Bureau, Bureau of Economic Analysis, and Bureau of Labor Statistics. Leveraging the unique strengths of each source, our data modeling team creates an authoritative dataset that captures more than 99% of all workers in the United States. This core offering is then enriched with data from online social profiles, resumés, and job postings to give you a complete view of the workforce.

Emsi data is frequently cited in major publications such as *The Atlantic*, *Forbes*, *Harvard Business Review*, *The New York Times*, *The Wall Street Journal*, and *USA Today*.



## Report Parameters

### 20 Occupations

15-2031	Operations Research Analysts
43-2099	Communications Equipment Operators, Other
11-3051	Industrial Production Managers
13-1198	Project Management Specialists and Business Operations Specialists, All Other

43-5031	Public Safety Telecommunicators
15-1212	Information Security Analysts
11-3021	Computer and Information Systems Managers
17-3025	Environmental Engineering Technologists and Technicians

### 1 Nation

0	United States
---	---------------

### Class of Worker

QCEW Employees

The information in this report pertains to the chosen occupations and geographical area.

## Executive Summary

### Average Job Posting Demand Over an Average Supply of Regional Jobs



**Jobs (2017)**

United States is about average for this kind of job. The national average for an area this size is 3,027,488\* employees, while there are 3,027,488 here.



**Compensation**

Earnings are about average in United States. The national median salary for your occupations is \$82,297, compared to \$82,297 here.



**Job Posting Demand**

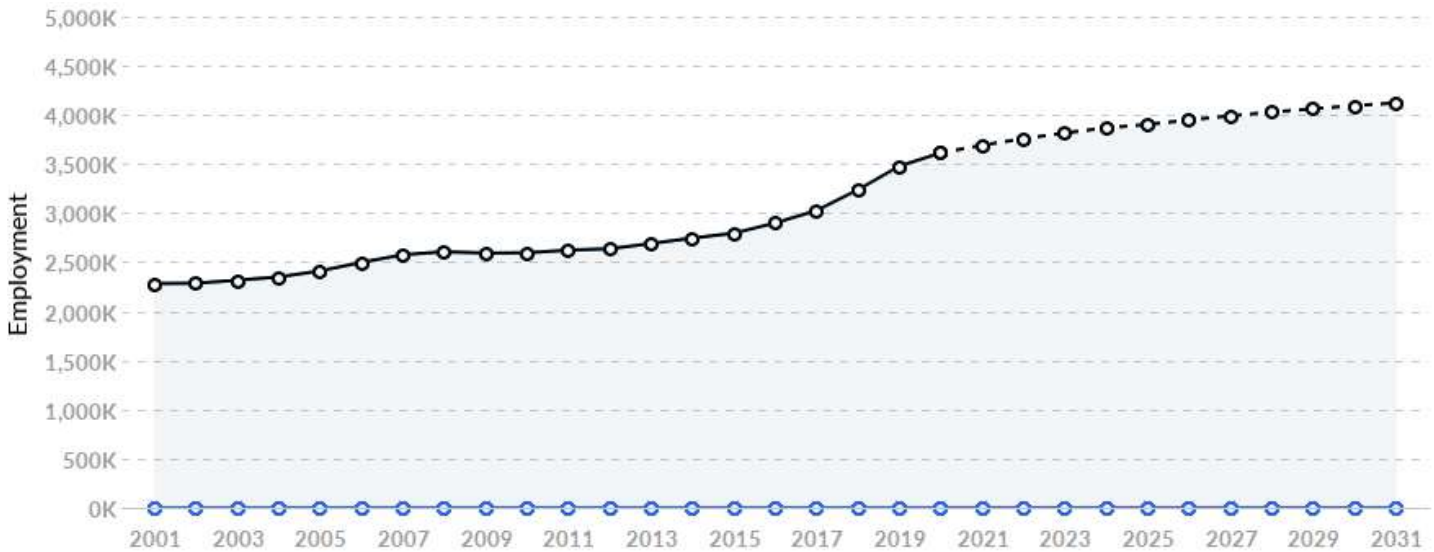
Job posting activity is about average in United States. The national average for an area this size is 134,042\* job postings/mo, while there are 134,042 here.

\*National average values are derived by taking the national value for your occupations and scaling it down to account for the difference in overall workforce size between the nation and United States. In other words, the values represent the national average adjusted for region size.

# Jobs

## Regional Employment Is About Equal to the National Average

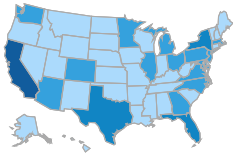
An average area of this size typically has 3,027,488\* jobs, while there are 3,027,488 here.



Region	2017 Jobs	2029 Jobs	Change	% Change
● United States	3,027,488	4,062,896	1,035,408	34.2%
● National Average	3,027,488	4,062,896	1,035,408	34.2%
● Adair County, KY	46	54	8	18.7%
● Allen County, KY	57	88	31	55.8%
● Barren County, KY	171	268	97	56.9%
● Butler County, KY	47	58	11	22.8%
● Christian County, KY	745	616	-129	-17.3%
● Cumberland County, KY	23	59	35	150.4%
● Daviess County, KY	686	788	102	14.9%
● Edmonson County, KY	32	40	8	23.8%

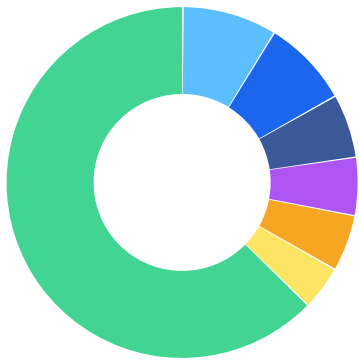
\*National average values are derived by taking the national value for your occupations and scaling it down to account for the difference in overall workforce size between the nation and United States. In other words, the values represent the national average adjusted for region size.

## Regional Breakdown



State	2017 Jobs
California	413,251
Texas	241,193
Florida	166,465
New York	145,910
Illinois	131,803

## Most Jobs are Found in the Federal Government, Civilian Industry Sector

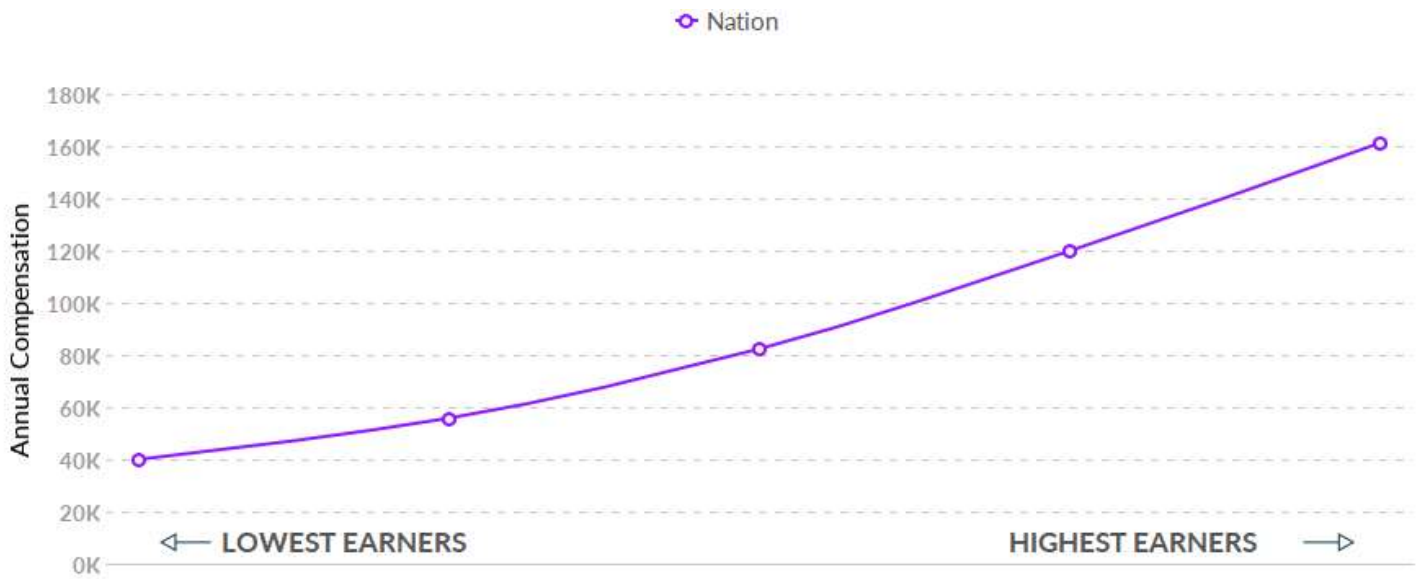


Industry	% of Occupation in Industry (2017)
Federal Government, Civilian	8.7%
General Medical and Surgical Hospitals	8.0%
Local Government, Excluding Education and Hospitals	5.9%
Computer Systems Design and Related Services	5.4%
Management of Companies and Enterprises	5.2%
Management, Scientific, and Technical Consulting Services	4.1%
Other	62.8%

# Compensation

## Regional Compensation Is the Same Cost as the Nation

In 2020, the median compensation for your occupations in the United States is \$82,297.





# Job Posting Activity



## 7,238,273 Unique Job Postings

The number of unique postings for this job from Jan 2017 to Jun 2021.



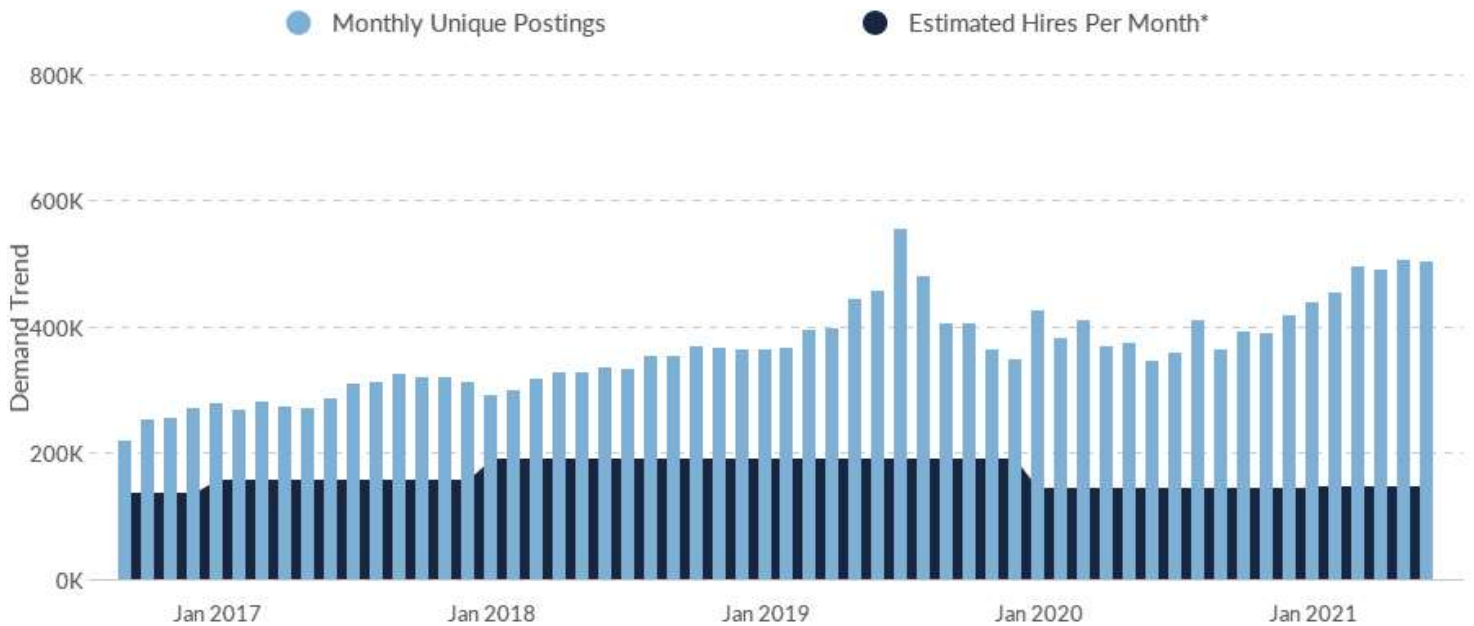
## 240,437 Employers Competing

All employers in the region who posted for this job from Jan 2017 to Jun 2021.



## 32 Day Median Duration

















Posting duration is 2 days longer than what's typical in the region.



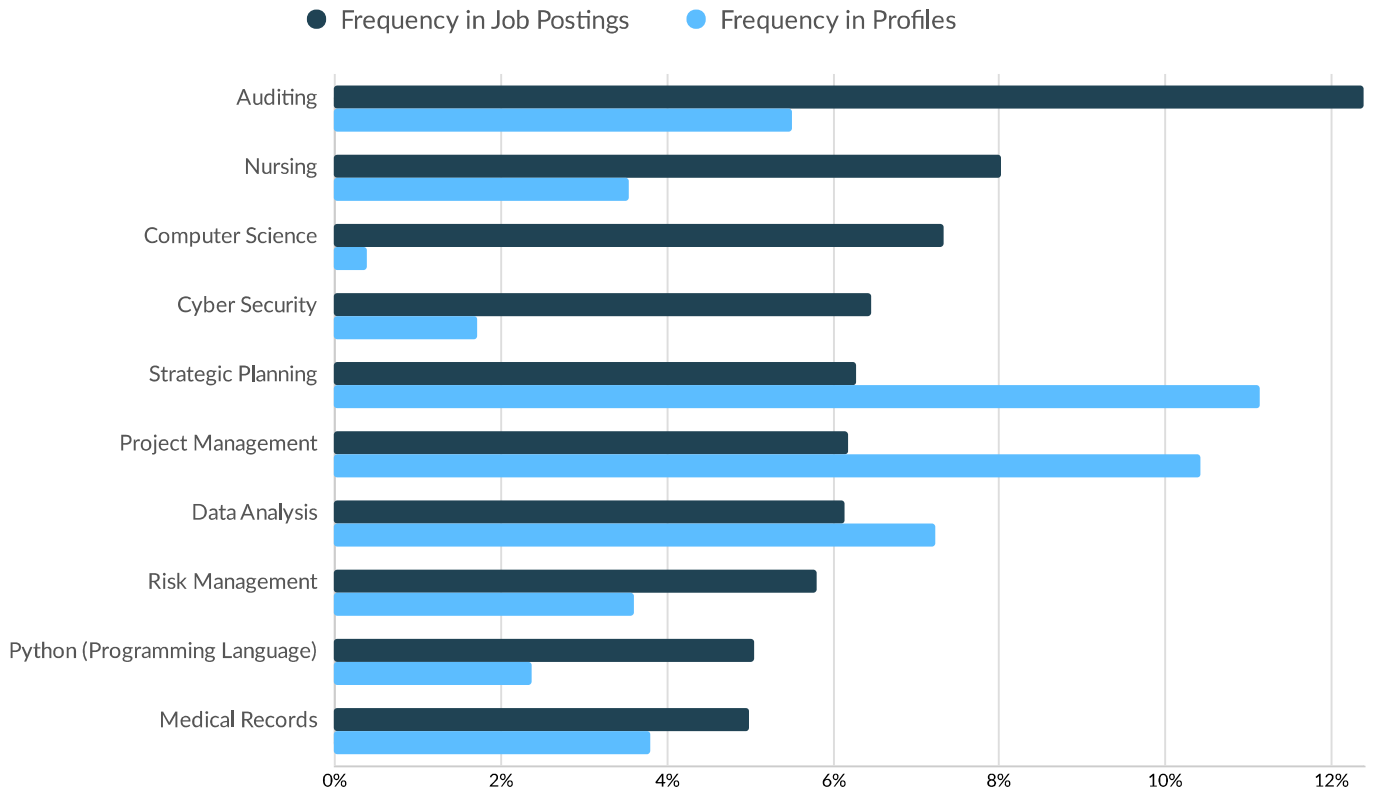
Occupation	Avg Monthly Postings (Jan 2017 - Jun 2021)	Avg Monthly Hires (Jan 2017 - Jun 2021)
Medical and Health Services Managers	76,733	15,098
Project Management Specialists and Business Operations Specialists, All Other	62,653	81,927
Information Security Analysts	58,525	6,597
Computer and Information Systems Managers	52,999	16,783

\*A hire is reported by the Quarterly Workforce Indicators when an individual's Social Security Number appears on a company's payroll and was not there the quarter before. Emsi hires are calculated using a combination of Emsi jobs data, information on separation rates from the Bureau of Labor Statistics (BLS), and industry-based hires data from the Census Bureau.

Occupation	Avg Monthly Postings (Jan 2017 - Jun 2021)	Avg Monthly Hires (Jan 2017 - Jun 2021)
Medical Dosimetrists, Medical Records Specialists, and Health Technologists and Technicians, All Other	32,484	10,315
Industrial Production Managers	20,173	4,742
Computer and Information Research Scientists	18,140	1,316
Operations Research Analysts	15,026	3,596
Environmental Science and Protection Technicians, Including Health	9,174	2,205
Environmental Scientists and Specialists, Including Health	5,640	3,391
Chemical Technicians	3,939	2,481
Life, Physical, and Social Science Technicians, All Other	3,837	5,497
Emergency Management Directors	3,224	507
Calibration Technologists and Technicians and Engineering Technologists and Technicians, Except Drafters, All Other	3,051	4,824
Public Safety Telecommunicators	2,180	2,958
Agricultural and Food Science Technicians	1,744	2,069
Environmental Engineering Technologists and Technicians	1,328	1,028
Epidemiologists	656	381
Geological and Hydrologic Technicians	525	992
Communications Equipment Operators, All Other	388	815

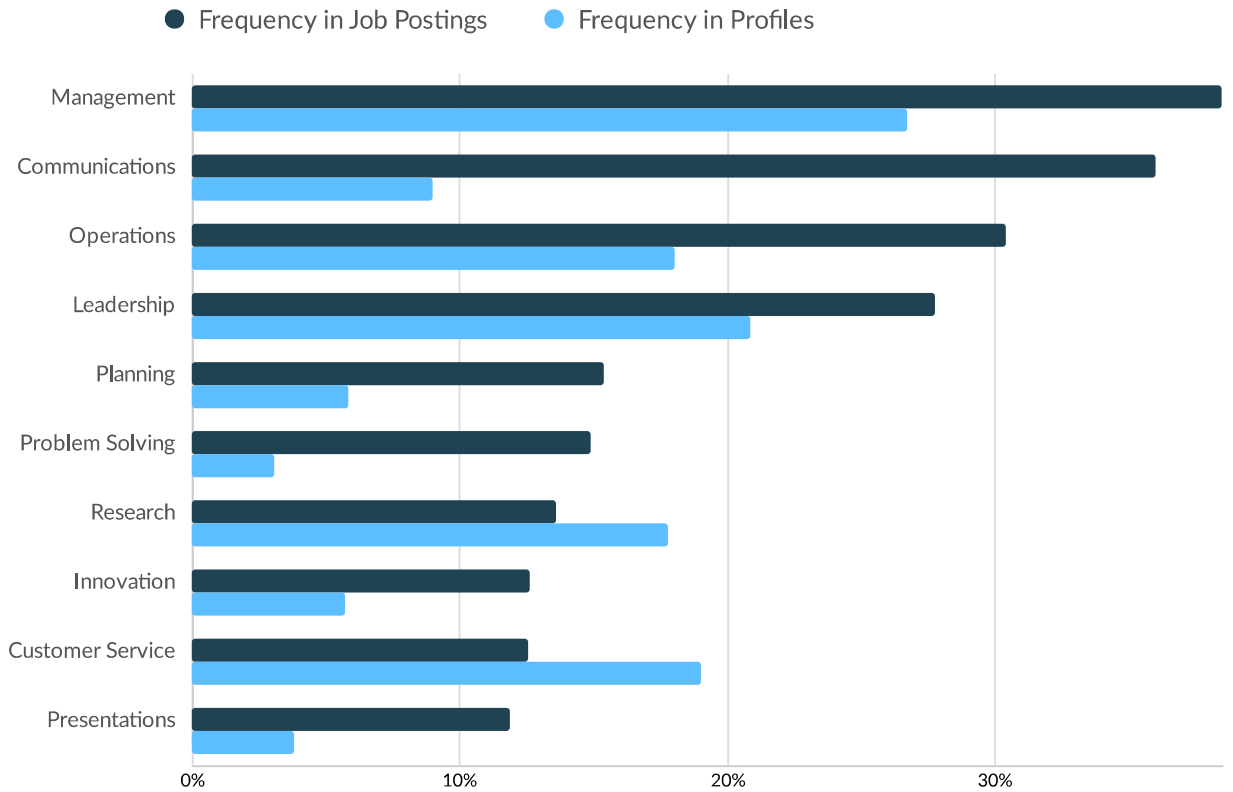
Top Companies	Unique Postings	Top Job Titles	Unique Postings
Anthem, Inc.	287,540 	Data Scientists	82,099 
Oracle Corporation	126,848 	Directors of Nursing	64,303 
Deloitte LLP	77,081 	Security Engineers	42,882 
Wells Fargo & Company	41,350 	Medical Directors	41,591 
UnitedHealth Group Incorporate...	39,428 	Laboratory Technicians	37,874 
Amazon.com, Inc.	37,927 	Production Managers	36,775 
General Dynamics Corporation	37,701 	Quality Assurance Managers	32,712 
Virtual Vocations	37,306 	Field Technicians	31,179 
Accenture PLC	34,080 	Patient Care Technicians	30,773 
Booz Allen Hamilton Holding Co...	33,159 	Information Security Analysts	30,647 

## Top Hard Skills



Skills	Postings	% of Total Postings	Profiles	% of Total Profiles
Auditing	897,267	12%	216,806	6%
Nursing	581,126	8%	139,335	4%
Computer Science	531,522	7%	15,631	0%
Cyber Security	467,921	6%	68,067	2%
Strategic Planning	454,498	6%	438,620	11%
Project Management	448,451	6%	410,429	10%
Data Analysis	444,780	6%	284,582	7%
Risk Management	420,243	6%	141,928	4%
Python (Programming Language)	366,637	5%	93,825	2%
Medical Records	361,474	5%	149,454	4%

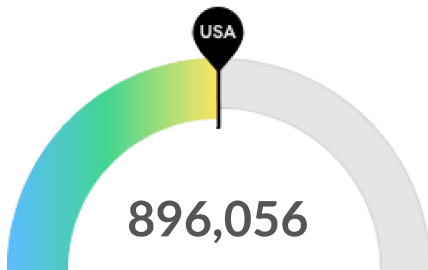
## Top Common Skills



Skills	Postings	% of Total Postings	Profiles	% of Total Profiles
Management	2,786,426	38%	1,051,438	27%
Communications	2,608,819	36%	354,681	9%
Operations	2,202,470	30%	710,642	18%
Leadership	2,010,829	28%	821,110	21%
Planning	1,116,083	15%	229,998	6%
Problem Solving	1,080,605	15%	120,469	3%
Research	984,745	14%	700,403	18%
Innovation	915,377	13%	225,652	6%
Customer Service	907,400	13%	748,380	19%
Presentations	859,305	12%	149,447	4%

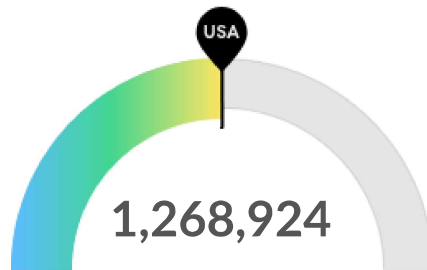
## Demographics

### Retirement Risk Is About Average, While Overall Diversity Is About Average



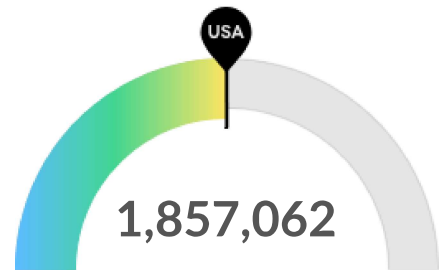
**Retiring Soon**

Retirement risk is about average in the United States. The national average for an area this size is 896,056\* employees 55 or older, while there are 896,056 here.



**Racial Diversity**

Racial diversity is about average in the United States. The national average for an area this size is 1,268,924\* racially diverse employees, while there are 1,268,924 here.

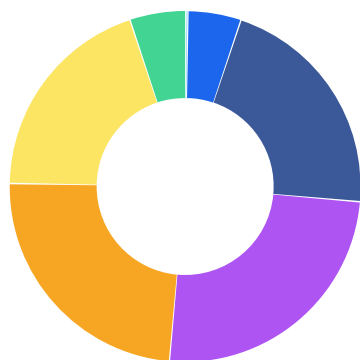


**Gender Diversity**

Gender diversity is about average in the United States. The national average for an area this size is 1,857,062\* female employees, while there are 1,857,062 here.

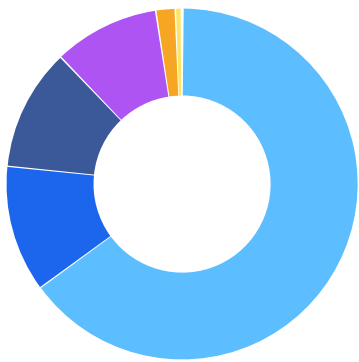
\*National average values are derived by taking the national value for your occupations and scaling it down to account for the difference in overall workforce size between the nation and the United States. In other words, the values represent the national average adjusted for region size.

## Occupation Age Breakdown



	% of Jobs	Jobs
14-18	0.2%	6,943
19-24	4.9%	176,747
25-34	21.2%	767,240
35-44	25.0%	904,896
45-54	23.8%	861,724
55-64	19.6%	709,629
65+	5.2%	186,426

### Occupation Race/Ethnicity Breakdown



	% of Jobs	Jobs
White	64.9%	2,344,682
Black or African American	11.7%	421,535
Hispanic or Latino	11.2%	406,033
Asian	9.7%	352,221
Two or More Races	1.8%	64,031
American Indian or Alaska Native	0.5%	19,758
Native Hawaiian or Other Pacific Islander	0.1%	5,345

### Occupation Gender Breakdown



	% of Jobs	Jobs
Males	48.6%	1,756,545
Females	51.4%	1,857,062

# Occupational Programs



**232 Programs**

Of the programs that can train for this job, 232 have produced completions in the last 5 years.



**2,382,757 Completions (2019)**

The completions from all regional institutions for all degree types.













**491,818 Openings (2019)**

The average number of openings for an occupation in the region is 24,818.

CIP Code	Top Programs	Completions (2019)
24.0101	Liberal Arts and Sciences/Liberal Studies	359,305
52.0201	Business Administration and Management, General	349,569
51.3801	Registered Nursing/Registered Nurse	246,408
24.0102	General Studies	126,405
26.0101	Biology/Biological Sciences, General	88,322
52.0101	Business/Commerce, General	58,327
11.0701	Computer Science	47,619
11.0101	Computer and Information Sciences, General	46,295
43.0104	Criminal Justice/Safety Studies	46,019
45.1001	Political Science and Government, General	45,155



Top Schools	Completions (2019)
Western Governors University	24,283 
University of Phoenix-Arizona	20,202 
Ivy Tech Community College	15,624 
Miami Dade College	14,922 
Valencia College	12,395 
Southern New Hampshire University	11,568 
University of Maryland Global Campus	10,939 
Grand Canyon University	10,841 
Broward College	10,305 
Chamberlain University-Illinois	9,364 

## Appendix A (Occupations)

Code	Description
15-2031	Operations Research Analysts
43-2099	Communications Equipment Operators, All Other
11-3051	Industrial Production Managers
13-1198	Project Management Specialists and Business Operations Specialists, All Other
11-9161	Emergency Management Directors
43-5031	Public Safety Telecommunicators
15-1212	Information Security Analysts
11-3021	Computer and Information Systems Managers
17-3025	Environmental Engineering Technologists and Technicians
19-4011	Agricultural and Food Science Technicians

Code	Description
19-4031	Chemical Technicians
19-4045	Geological and Hydrologic Technicians
19-4099	Life, Physical, and Social Science Technicians, All Other
17-3098	Calibration Technologists and Technicians and Engineering Technologists and Technicians, Except Drafters, All Other
15-1221	Computer and Information Research Scientists
11-9111	Medical and Health Services Managers
29-2098	Medical Dosimetrists, Medical Records Specialists, and Health Technologists and Technicians, All Other
19-4042	Environmental Science and Protection Technicians, Including Health
19-2041	Environmental Scientists and Specialists, Including Health
19-1041	Epidemiologists

# Job Posting Analytics

Emsi Q2 2021 Data Set

July 2021

Kentucky

# Parameters

## Regions:

Code	Description
0	United States

## Skills (Has Any):

Results should Include any of the selected skills

Code	Skills (Has Any)	Code	Skills (Has Any)
Qualification	Cybersecurity Forensic Analyst	Hard Skill	Cyber Warfare
Hard Skill	Cyber Defense	Hard Skill	Supply Chain Cyber Security
Hard Skill	Cyber Security	Hard Skill	Cyber Security Assessment
Hard Skill	Cyber Resilience	Hard Skill	Cyber Security Standards
Hard Skill	Cyber Threat Intelligence	Hard Skill	Cyber Threat Hunting
Hard Skill	Cyber Security Strategy	Hard Skill	Cybersecurity Compliance
Hard Skill	Cyber Laws	Hard Skill	Cyberinfrastructure

Minimum Experience Required: Any

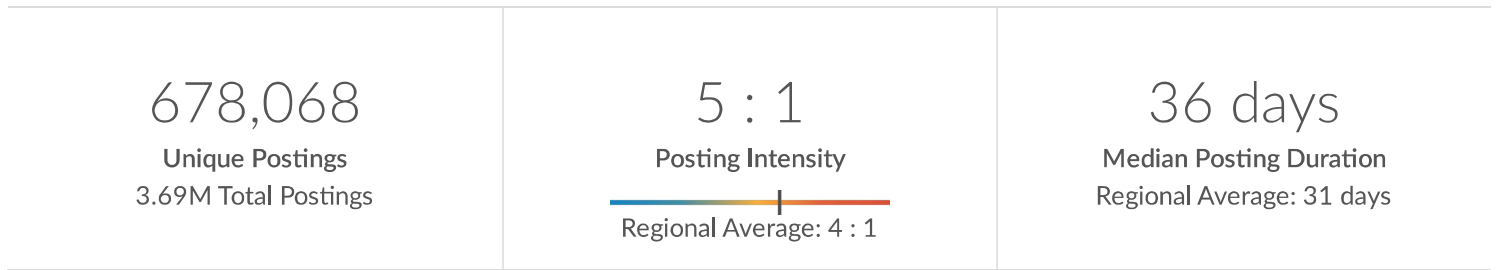
Education Level: Any

Keyword Search:

Timeframe: Jan 2017 - Mar 2020

Posting Lifespan: Any Duration

# Job Postings Summary



There were 3.69M total job postings for your selection from January 2017 to March 2020, of which 678,068 were unique. These numbers give us a Posting Intensity of 5-to-1, meaning that for every 5 postings there is 1 unique job posting.

This is higher than the Posting Intensity for all other occupations and companies in the region (4-to-1), indicating that they may be trying harder to hire for this position.

## Advertised Salary

There are 48,754 advertised salary observations (7% of the 678,068 matching postings).

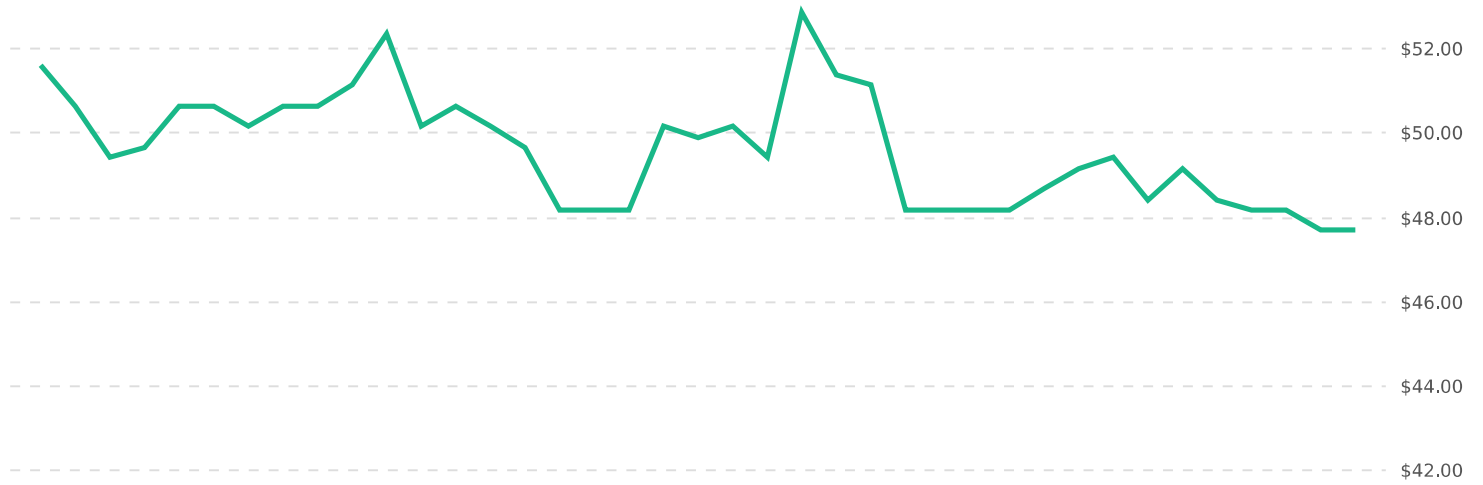
**\$48.18/hr**  
Median Advertised Salary



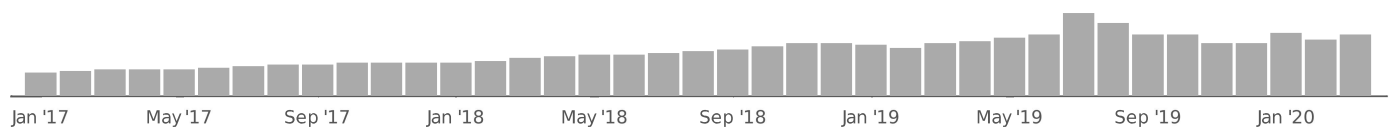
# Advertised Wage Trend Beta

▼ **7.6%** Jan 2017 - Mar 2020

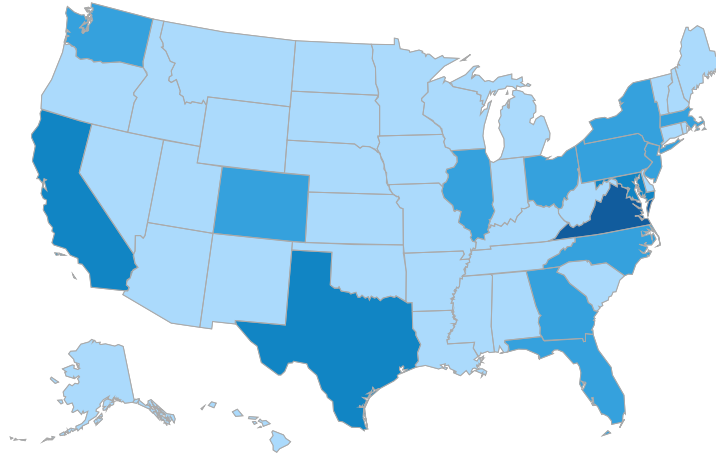
\$48.18 Median



678,068 Job Postings

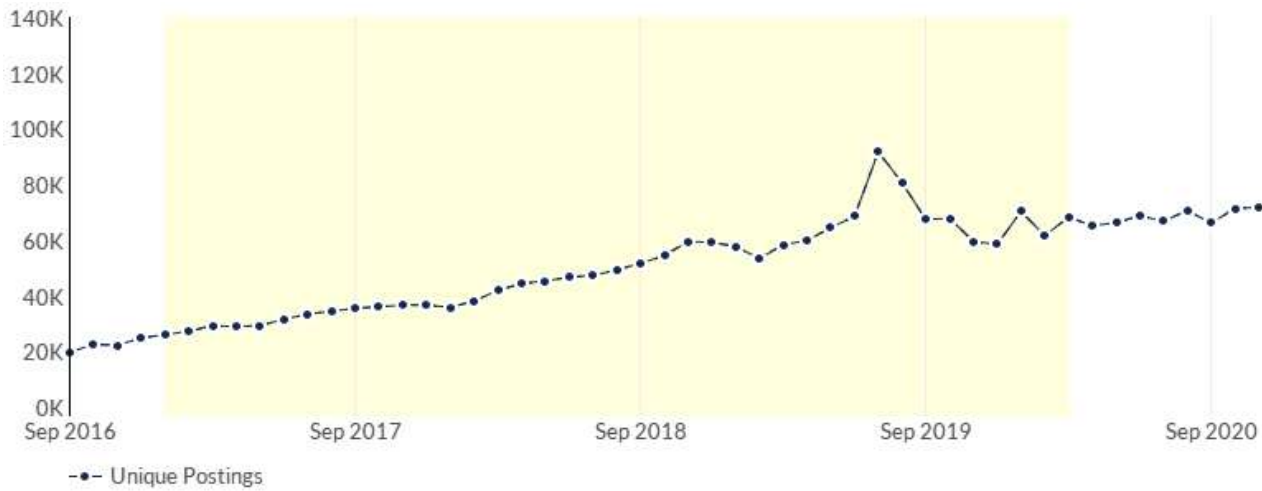


## Job Postings Regional Breakdown



State	Unique Postings (Jan 2017 - Mar 2020)
Virginia	101,125
California	71,814
Texas	51,648
Maryland	44,388
New York	36,249

## Unique Postings Trend











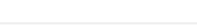

Month	Unique Postings	Posting Intensity
Jun 2021	105,371	7 : 1
May 2021	102,695	7 : 1
Apr 2021	90,578	8 : 1
Mar 2021	89,834	8 : 1
Feb 2021	82,656	8 : 1
Jan 2021	79,075	8 : 1
Dec 2020	75,392	8 : 1
Nov 2020	71,733	8 : 1
Oct 2020	71,444	8 : 1
Sep 2020	66,148	8 : 1
Aug 2020	70,684	8 : 1
Jul 2020	66,852	8 : 1



## Education & Experience Breakdown

Education Level	Unique Postings	% of Total	Minimum Experience	Unique Postings	% of Total
No Education Listed	183,339	27%	No Experience Listed	184,691	27%
High school or GED	28,279	4%	0 - 1 Years	73,305	11%
Associate's degree	29,542	4%	2 - 3 Years	175,128	26%
Bachelor's degree	433,734	64%	4 - 6 Years	161,748	24%
Master's degree	137,139	20%	7 - 9 Years	47,418	7%
Ph.D. or professional degree	42,787	6%	10+ Years	35,778	5%

## Top Companies Posting

	Total/Unique (Jan 2017 - Mar 2020)	Posting Intensity	Median Posting Duration
Booz Allen Hamilton Holding Corporation	197,203 / 19,267	10 : 1 	49 days
Deloitte LLP	94,880 / 18,969	5 : 1 	48 days
Leidos Holdings, Inc.	96,651 / 12,018	8 : 1 	33 days
Raytheon Technologies	63,442 / 10,445	6 : 1 	44 days
Lockheed Martin Corporation	57,110 / 9,641	6 : 1 	35 days
General Dynamics Corporation	74,449 / 9,421	8 : 1 	48 days
Wells Fargo & Company	50,856 / 7,967	6 : 1 	14 days
International Business Machines Corporation (IBM)	37,294 / 6,978	5 : 1 	51 days
Northrop Grumman Corporation	55,711 / 6,837	8 : 1 	46 days
Oracle Corporation	25,200 / 6,250	4 : 1 	52 days

## Top Cities Posting

City	Total/Unique (Jan 2017 - Mar 2020)	Posting Intensity	Median Posting Duration
Washington, DC	179,839 / 32,388	6 : 1	37 days
New York, NY	149,780 / 24,526	6 : 1	38 days
Arlington, VA	105,503 / 16,036	7 : 1	45 days
Chicago, IL	65,184 / 11,545	6 : 1	41 days
Reston, VA	68,591 / 11,263	6 : 1	43 days
McLean, VA	75,976 / 10,640	7 : 1	43 days
Atlanta, GA	59,340 / 10,491	6 : 1	40 days
San Francisco, CA	54,097 / 9,905	5 : 1	41 days
San Diego, CA	61,862 / 8,924	7 : 1	47 days
Boston, MA	35,329 / 7,948	4 : 1	39 days

## Top Posted Occupations

	Total/Unique (Jan 2017 - Mar 2020)	Posting Intensity	Median Posting Duration
Information Security Analysts	1,647,075 / 282,099	6 : 1	38 days
Software Developers and Software Quality Assurance Analysts and Testers	370,790 / 63,808	6 : 1	36 days
Computer and Information Systems Managers	235,293 / 45,732	5 : 1	38 days
Network and Computer Systems Administrators	234,980 / 40,076	6 : 1	37 days
Computer Occupations, All Other	211,938 / 39,051	5 : 1	35 days
Computer User Support Specialists	86,600 / 17,729	5 : 1	31 days
Detectives and Criminal Investigators	76,742 / 11,763	7 : 1	39 days
Marketing Managers	43,349 / 10,917	4 : 1	38 days
Management Analysts	56,898 / 9,821	6 : 1	35 days
Computer Systems Analysts	54,782 / 9,681	6 : 1	37 days

## Top Posted Job Titles

	Total/Unique (Jan 2017 - Mar 2020)	Posting Intensity	Median Posting Duration
Cybersecurity Analysts	122,046 / 19,547	6 : 1	35 days
Cybersecurity Engineers	107,097 / 15,452	7 : 1	40 days
Cybersecurity Specialists	49,089 / 9,011	5 : 1	34 days
Security Engineers	42,970 / 7,544	6 : 1	39 days
Information Security Engineers	45,225 / 7,274	6 : 1	31 days
Cybersecurity Managers	34,695 / 7,267	5 : 1	37 days
Information Security Analysts	39,096 / 6,846	6 : 1	35 days
Systems Engineers	38,086 / 6,044	6 : 1	38 days
Software Engineers	38,197 / 6,012	6 : 1	35 days
Cyber Threat Analysts	34,580 / 5,728	6 : 1	34 days

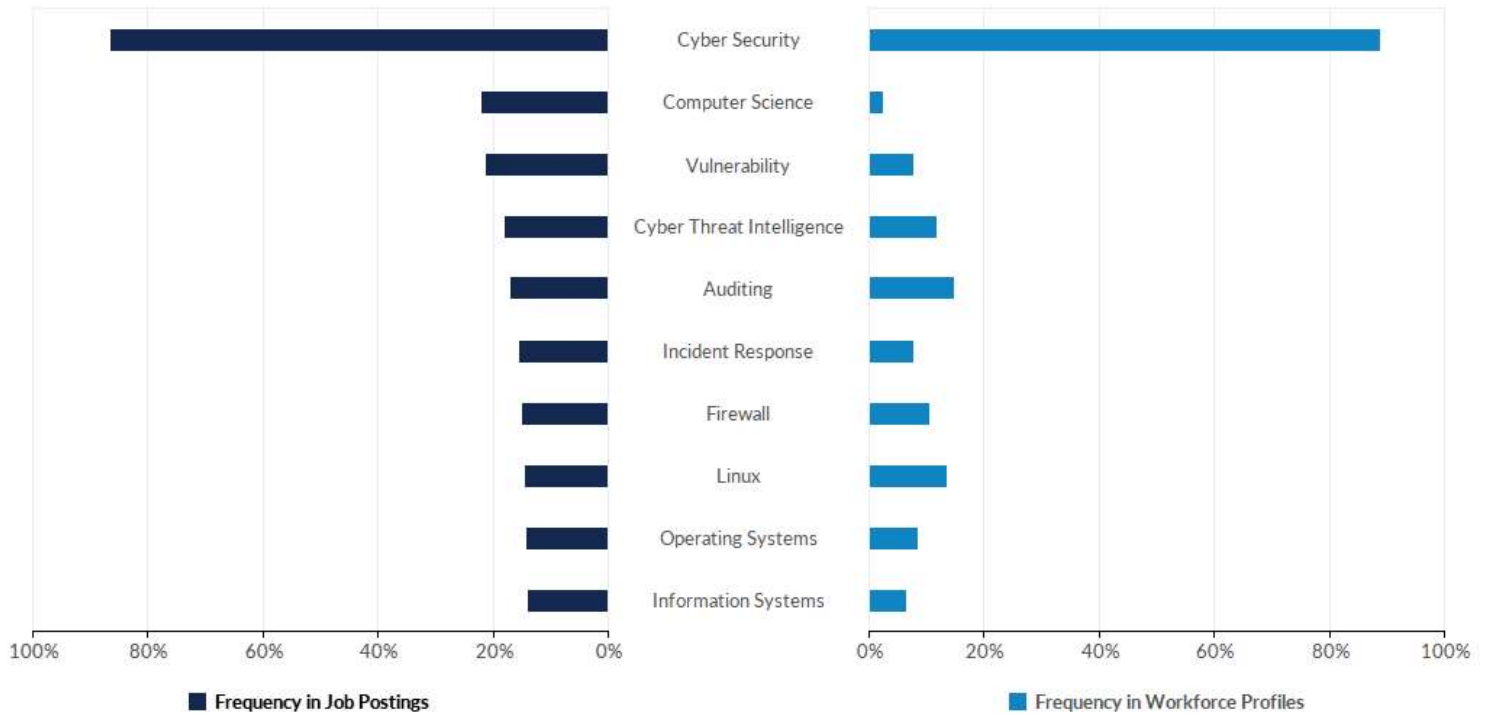
## Top Industries

	Total/Unique (Jan 2017 - Mar 2020)	Posting Intensity	Median Posting Duration
Professional, Scientific, and Technical Services	1,528,426 / 273,546	6 : 1	39 days
Manufacturing	453,270 / 79,899	6 : 1	39 days
Administrative and Support and Waste Management and Remediation Services	467,071 / 78,907	6 : 1	33 days
Finance and Insurance	363,363 / 61,911	6 : 1	35 days
Information	276,953 / 54,888	5 : 1	39 days
Public Administration	82,391 / 18,784	4 : 1	27 days
Retail Trade	76,810 / 16,854	5 : 1	35 days
Educational Services	64,465 / 15,678	4 : 1	41 days
Health Care and Social Assistance	40,865 / 8,591	5 : 1	38 days
Utilities	42,869 / 6,975	6 : 1	34 days

The following provides insight into the supply and demand of relevant skills by comparing the frequency of skills present in job postings against skills present in today's workforce. Along with Emsi's job posting analytics, this comparison leverages Emsi's dataset of more than 100M online resumés and profiles. All resumés and profiles used in these comparisons have been updated within the last three years.

*\*The skills associated with workforce profiles represent workers of all education and experience levels.*

## Top Hard Skills



## Top Hard Skills

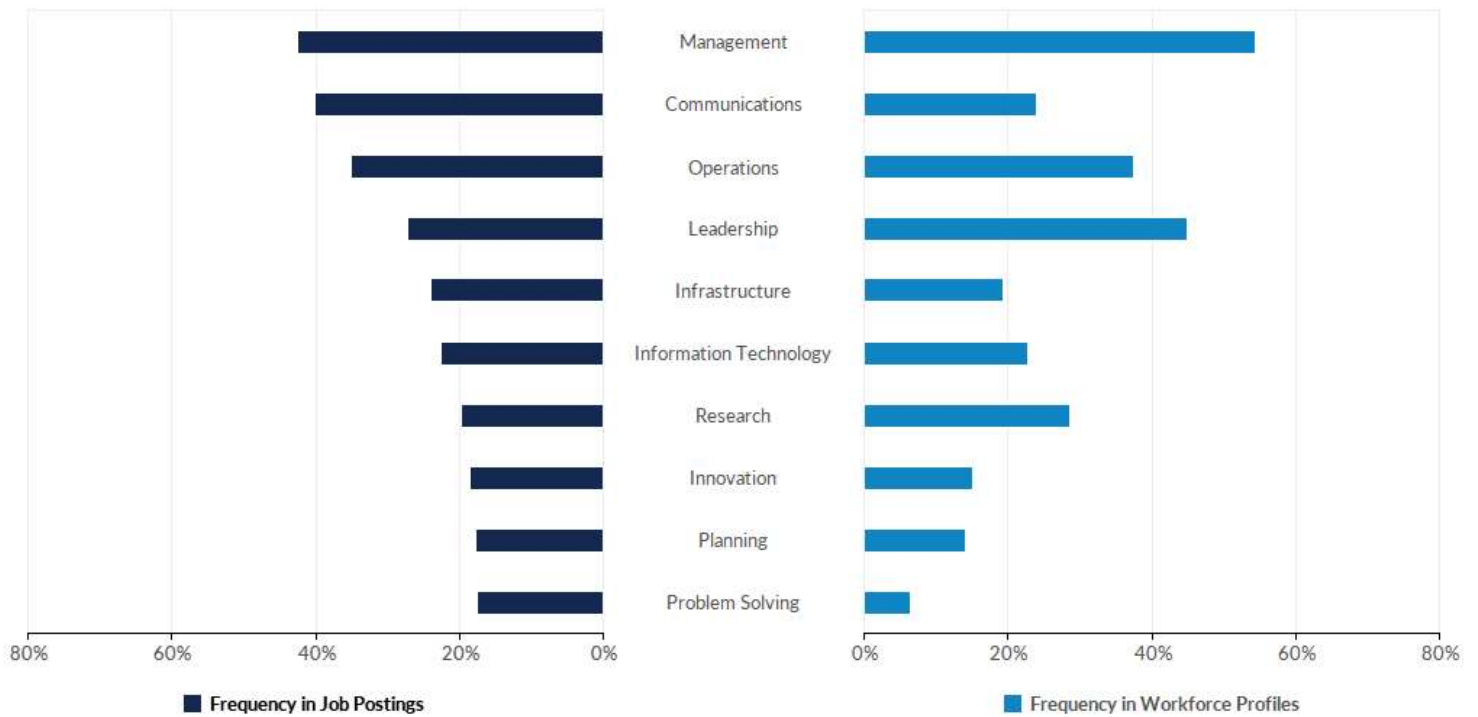
	Frequency in Postings	Postings with Skill / Total Postings (Jan 2017 - Mar 2020)	Frequency in Profiles	Profiles with Skill / Total Profiles (2019 - 2021)
Cyber Security	87%	586,921 / 678,068	89%	221,791 / 249,404
Computer Science	22%	150,749 / 678,068	3%	6,351 / 249,404
Vulnerability	21%	144,611 / 678,068	8%	19,211 / 249,404
Cyber Threat Intelligence	18%	123,113 / 678,068	12%	29,770 / 249,404
Auditing	17%	115,498 / 678,068	15%	36,795 / 249,404
Incident Response	15%	105,047 / 678,068	8%	19,616 / 249,404
Firewall	15%	102,329 / 678,068	11%	26,681 / 249,404
Linux	15%	99,636 / 678,068	14%	34,043 / 249,404

---

Operating Systems	14%	96,793 / 678,068	8%	21,193 / 249,404
Information Systems	14%	95,216 / 678,068	6%	16,086 / 249,404

---

## Top Common Skills



## Top Common Skills

	Frequency in Postings	Postings with Skill / Total Postings (Jan 2017 - Mar 2020)	Frequency in Profiles	Profiles with Skill / Total Profiles (2019 - 2021)
Management	43%	288,986 / 678,068	54%	135,889 / 249,404
Communications	40%	272,395 / 678,068	24%	59,631 / 249,404
Operations	35%	237,381 / 678,068	38%	93,701 / 249,404
Leadership	27%	184,423 / 678,068	45%	111,972 / 249,404
Infrastructure	24%	163,029 / 678,068	19%	48,191 / 249,404
Information Technology	23%	153,521 / 678,068	23%	56,587 / 249,404
Research	20%	133,996 / 678,068	29%	71,217 / 249,404
Innovation	19%	125,582 / 678,068	15%	37,647 / 249,404
Planning	18%	120,329 / 678,068	14%	34,947 / 249,404
Problem Solving	17%	118,231 / 678,068	6%	15,978 / 249,404

# Top Qualifications

	Postings with Qualification
Certified Ethical Hacker	43,194
Certified Information Security Manager	61,204
Certified Information System Auditor (CISA)	56,228
Certified Information Systems Security Professional	160,470
CompTIA Security+	54,127
GIAC Certifications	76,454
GIAC Certified Incident Handler	25,635
IAT Level II Certification	24,226
Secret Clearance	42,778
Top Secret-Sensitive Compartmented Information (TS/SCI Clearance)	79,853

# Appendix A

## Top Posting Sources

Website	Postings on Website (Jan 2017 - Mar 2020)
Nexxt.com	243,405
Employmentcrossing.com	97,106
Monster.com	72,366
My.jobs	70,107
Beyond.com	68,654
Geebo.com	68,560
Jobserve.com	61,357
Dejobs.org	52,553
Careerboard.com	51,227
Dice.com	50,613
Learn4good.com	41,304
Careerbuilder.com	37,824
Resume-library.com	35,484
Neuvoo.com	35,477
Jobs.net	32,565
Jobing.com	32,143
Glassdoor.com	31,942
Nettemps.com	31,222
Clearancejobs.com	30,810
Careerarc.com	25,451
Gijobs.com	25,265
Bluecollarcrossing.com	23,945
Disabledperson.com	22,015
Recruitenetworks.com	19,502
Thejobnetwork.com	19,202



# Appendix B

## Sample Postings

# Cybersecurity Analysts — Smartronix, Inc. in Dahlgren, VA (Sep 2017 - Dec 2017)

## Senior Cyber Security Analyst

Link to Live Job Posting: Posting is no longer active

Location: Dahlgren, VA

O\*NET: 15-1122.00

Company: Smartronix, Inc.

Job Title: Cybersecurity Analysts

Senior Cyber Security Analyst Smartronix 3.643 Reviews - Dahlgren, VA Apply on Company Site 2 days ago Smartronix, Inc., is an information technology and engineering solutions provider specializing in Cloud Computing, Cyber Security, Health IT, Network Operations, and Mission-Focused Engineering. Smartronix is seeking Cyber Security and Information Assurance professionals to support various programs at NAVSEA and NSWCDD.

### Responsibilities include:

Navy Qualified Validator providing Cybersecurity, Risk Management, Certification and Accreditation, Information Assurance oversight, technical support and documentation, as specified in the DoD Instruction 8500.01 and SECNAV Instruction 5239.3B to the Naval Surface Warfare Center Dahlgren Division (NSWCDD) (which includes NSWC Dahlgren and the non-engineering support for Combat Direction Systems Activity (CDSA) Dam Neck). DoDI 8500.01 defines this policy to include Risk Management, Operational Resilience, Integration and Interoperability, Cyberspace Defense, DoD Information, Identity Assurance, Information Technology, Cybersecurity Workforce and Mission Partners. SECNAV Instruction 5239.3B, establishes the Information Assurance policy for the Department of the Navy (DoN) consistent with national and Department of Defense (DoD) policies. Support of Cybersecurity efforts and recommendation, documentation, evaluation, validation and risk management from inception to decommission per DoD Acquisition Lifecycle Management for multiple US Naval Warfare and Combat Systems, and the associated information technology equipment including the AEGIS Ship Self Defense System (SSDS) and other existing and future systems. Provide Information Assurance Officer (IAO) support, also known as Information Systems Security Office (ISSO), and Certification and Accreditation package preparation, validation and sustainment for existing and future US Navy systems. Responsibilities include providing a broad spectrum of cybersecurity support services maintaining and validating RDT&E packages. Maintains thorough knowledge of current and ongoing Certification and Accreditation (C&A) and cyber security standards to include DIACAP and Risk Management Framework (RMF) C&A standards. Works closely with systems owners, government managers, and other stakeholders to manage cyber security requirements. Required Skills Possess the ability to:

- Develop cybersecurity requirements, policy standards, best practices, guidance and procedures for combat systems.
- Conduct cybersecurity related research, analysis and coordination activities in support of DOD cyberassurance and policy efforts at multiple classification levels.
- Lead working groups to develop cybersecurity strategies to meet emerging threats.
- Perform analysis of cybersecurity, intelligence and information technology policy gaps for combat systems.
- Perform cybersecurity system engineering design, analysis and documentation of combat systems.
- Develop cybersecurity risk assessment analysis and risk mitigation plans for combat systems.
- Develop documentation of cybersecurity requirements, gap analysis, threat analysis, system engineering, risk assessment and mitigation for combat systems.
- Possess an understanding of cybersecurity, military system specifications, DoD IA policies and the ability to communicate clearly and succinctly in written and oral presentations. Required Experience
- Six (6) years' experience in cybersecurity requirements development, cyber threat analysis, cyber systems engineering, cyber systems architecture development or cybersecurity policy development experience.
- Five (5) years' experience working with Navy combat systems such as AEGIS, Ship Self Defense System, Cooperative Engagement Capability, Ground/Air Task Oriented Radar, Solid State Laser, Railgun or other combat systems.
- Minimum certification as IAT Level II per DoD 8570.01, or successor. Privileged User (Individuals who have access to system control,

monitoring, or administration functions (e.g., system administrator, IAO/ISSO, system programmers, etc.)) requires that a final adjudicated Single Scope Background Investigation (SSBI) with an IT level-1 designation in JPAS must be achieved and maintained.

- Navy Qualified Validator (NQV)

### Security Clearance:

A Top Secret clearance is required for this position. Applicant selected may be subject to a security investigation and must meet eligibility requirements for access to classified information. Job Location Dahlgren, VA Smartronix Reviews Smartronix43 3.6 StarStarStarStarStar Rating TrendsRating Trends Recommend to a friend Approve of CEO M. Arshed Javaid 23 Ratings 1. Jun 26, 2017 "Snail between shells sizes" StarStarStarStarStar + Work/Life Balance + Culture & Values + Career Opportunities + Comp & Benefits + Senior Management Current Employee - Anonymous Employee Recommends Positive Outlook Approves of CEO I have been working at Smartronix full-time Pros Excellent family-like friendly atmosphere. Company endorsed community events. Employees are excellent at what they do Cons Management has some growing pains in some business units, Nepotism is present and something to be aware of looking to advance your career. Advice to Management Trust your specialized skilled employees, mgmt does not always need to piece meal information for projects to the completed, in certain instances, this practice typically extends project cost and timelines. Smartronix 2017-06-26 10:23 PDT

\_\_\_\_\_ 2. Jul 23, 2017 "Data Analyst" StarStarStarStarStar + Work/Life Balance + Culture & Values + Career Opportunities + Comp & Benefits + Senior Management Current Employee - Data Analyst Recommends Neutral Outlook No opinion of CEO I have been working at Smartronix full-time (More than a year) Pros A lot of flexibility, easy and rewarding work, great people, provides clearance if necessary. Cons Pay is low, salary is not the same for employees with the same title, not a lot of overtime available. Advice to Management Create lead positions or Data Analyst II positions that pay above the poverty rate. Paying employees minimal doesn't show how much show you care about your employees livelihood. Smartronix 2017-07-23 22:19 PDT

\_\_\_\_\_ 3. Jul 21, 2017 "Big company unorganized outdated training program" StarStarStarStarStar + Work/Life Balance + Culture & Values + Career Opportunities + Comp & Benefits + Senior Management Former Employee - Anonymous Employee Doesn't Recommend Neutral Outlook No opinion of CEO I worked at Smartronix full-time Pros good work life balance, flex time, casual office Cons not enough work to do. unorganized. Advice to Management no advice Smartronix 2017-07-21 08:59 PDT See All 43 Reviews

## Cyber Security and Cloud Consultant

Link to Live Job Posting: Posting is no longer active

Location: Bridgewater Township, NJ

O\*NET: 15-1122.00

Company: Diverse Lynx LLC

Job Title: Cybersecurity Consultants

Cyber Security and Cloud Consultant Bridgewater

NJ 20-01548 1579818097000

**Job Description Job Title:**

Cyber Security and Cloud Consultant Job location:

Bridgewater, NJ Job Type:

**Contract/ Full Time Mandatory Skills:**

Cyber Security & Cloud a.

**Primary:**

Cyber security assessment for

**ISA L3-L2**

systems, thorough knowledge of cyber security standards, thorough knowledge in network, firewalls, security policies, cyberattacks, protections etc, Experience in implementing cyber security for a large pharma manufacturing client

**Preferred Skills:**

a.

**Secondary:**

Implementation of MES, control systems, installation of L2-L3 systems, networking, firewall, security implementation

**Job Roles/Responsibilities:**

The Cyber Security consultant determines critical and high-risk security weaknesses that pose as potential vulnerabilities to life science manufacturing environments. The consultant will develop strategic roadmaps to devise and implement secure solutions that reduce risk by improving the overall cyber resilience of shopfloor assets. Conduct inventory and risk assessment for shopfloor assets Develop a prioritized heat map to categorize and identify high impact cyber threats. Develop prototype solutions to mitigate cyber threats Support governance programs for transformational change. Collaborate with business and support function stakeholders for implementation programs Support and/or manage implementation teams with cyber solutions on a local and global scale. Provide thought leadership in developing cyber programs for manufacturing environments. Maintain compliance programs with industry best practice across manufacturing operating technology assets. Diverse Lynx LLC is an Equal Employment Opportunity employer. All qualified applicants will receive due consideration for employment without any discrimination. All applicants will be evaluated solely on the basis of their ability, competence and their proven capability to perform the functions outlined in the corresponding role. We promote and support a diverse workforce across all levels in the company.

## Cloud Consultant

Link to Live Job Posting: Posting is no longer active

Location: Bridgewater Township, NJ

O\*NET: 15-1122.00

Company: Cognizant Technology Solutions Corporation

Job Title: Cloud Consultants

**Job Number:**

00035383072)

**Description Cyber Security and Cloud Consultant Bridgewater, NJ FTE Mandatory Skills:**

Cyber Security & Cloud a.

**Primary:**

Cyber security assessment for

**ISA L3-L2**

systems, thorough knowledge of cyber security standards, thorough knowledge in network, firewalls, security policies, cyberattacks, protections etc, Experience in implementing cyber security for a large pharma manufacturing client

**Preferred Skills:**

**Secondary:**

Implementation of MES, control systems, installation of L2-L3 systems, networking , firewall, security implementation

**Job Roles/Responsibilities:**

The Cyber Security consultant determines critical and highrisk security weaknesses that pose as potential vulnerabilities to life science manufacturing environments. The consultant will develop strategic roadmaps to to devise and implement secure solutions that reduce risk by improving the overall cyber resilience of shopfloor assets. Conduct inventory and risk assesment for shopfloor assetsDevelop a prioritized heatmap to categorize and identify high impact cyber threats. Develop prototype solutions to mitigate cyber threats Support governance programs for transformational change. Collaborate with business and support function stakeholders for implementation programs Support and/or manage implementation teams with cyber solutions on a local and global scale. Provide thought leadership in developing cyber programs for manufacturing environments. Maintain compliance programs with industry best practice across manufacturing operating technology assets. Cognizant US Corporation is an Equal Opportunity Employer

Minority/Female/Disability/Veteran. If you require accessibility assistance applying for open positions in the US, please send an email with your request to [CareersNA2@cognizant.com](mailto:CareersNA2@cognizant.com) Qualifications Technical Skills SNo Primary Skill Proficiency Level

- Rqrd./Dsrd. 1 Cyber Security & Cloud PL1 Required Domain Skills SNo Primary Skill Proficiency Level
- Rqrd./Dsrd. 1 Manufacturing Intell&Analytics NA Required
- Proficiency Legends Proficiency Level Generic Reference PL1 The associate has basic awareness and comprehension of the skill and is in the process of acquiring this skill through various channels.

PL2 The associate possesses working knowledge of the skill, and can actively and independently apply this skill in engagements and projects. PL3 The associate has comprehensive, in-depth and specialized knowledge of the skill. She / he has extensively demonstrated successful application of the skill in engagements or projects. PL4 The associate can function as a subject matter expert for this skill. The associate is capable of analyzing, evaluating and synthesizing solutions using the skill. Job Application Development / Application Maintenance Primary Location United States-New Jersey-Bridgewater - NJ

**USA, COG**

Employee Status Full Time Employee Schedule Full-time Job Type Standard Job Level Professional Shift Day Job Travel No Job Posting Nov 4, 2019, 4:06:13 PM Domain Manufacturing & Logistics Organization IT Services - United States

# Cybersecurity Analysts — Smartronix, Inc. in Hollywood, MD (Jul 2017 - Nov 2017)

## Senior Cyber Security Analyst

Link to Live Job Posting: Posting is no longer active

Location: Hollywood, MD

O\*NET: 15-1122.00

Company: Smartronix, Inc.

Job Title: Cybersecurity Analysts

Home / Search / Job Details Senior Cyber Security Analyst • Smartronix, Inc. • Hollywood, MD Posted 3 hours ago Analysis, Analyst, Architecture, Development, Lifecycle, Management, Research, Risk Management, Security, System Administrator, Validation Full Time, Full-Time/Regular Telecommuting not available Travel not required Job Description Smartronix, Inc., is an information technology and engineering solutions provider specializing in Cloud Computing, Cyber Security, Health IT, Network Operations, and Mission-Focused Engineering. Smartronix is seeking Cyber Security and Information Assurance professionals to support various programs at NAVSEA and NSWCDD.

### Responsibilities include:

Navy Qualified Validator providing Cybersecurity, Risk Management, Certification and Accreditation, Information Assurance oversight, technical support and documentation, as specified in the DoD Instruction 8500.01 and SECNAV Instruction 5239.3B to the Naval Surface Warfare Center Dahlgren Division (NSWCDD) (which includes NSWC Dahlgren and the non-engineering support for Combat Direction Systems Activity (CDSA) Dam Neck). DoDI 8500.01 defines this policy to include Risk Management, Operational Resilience, Integration and Interoperability, Cyberspace Defense, DoD Information, Identity Assurance, Information Technology, Cybersecurity Workforce and Mission Partners. SECNAV Instruction 5239.3B, establishes the Information Assurance policy for the Department of the Navy (DoN) consistent with national and Department of Defense (DoD) policies. Support of Cybersecurity efforts and recommendation, documentation, evaluation, validation and risk management from inception to decommission per DoD Acquisition Lifecycle Management for multiple US Naval Warfare and Combat Systems, and the associated information technology equipment including the AEGIS Ship Self Defense System (SSDS) and other existing and future systems. Provide Information Assurance Officer (IAO) support, also known as Information Systems Security Office (ISSO), and Certification and Accreditation package preparation, validation and sustainment for existing and future US Navy systems. Responsibilities include providing a broad spectrum of cybersecurity support services maintaining and validating RDT&E packages. Maintains thorough knowledge of current and ongoing Certification and Accreditation (C&A) and cyber security standards to include DIACAP and Risk Management Framework (RMF) C&A standards. Works closely with systems owners, government managers, and other stakeholders to manage cyber security requirements. Required Skills Possess the ability to: + Develop cybersecurity requirements, policy standards, best practices, guidance and procedures for combat systems. + Conduct cybersecurity related research, analysis and coordination activities in support of DOD cyberassurance and policy efforts are multiple classification levels. + Lead working groups to develop cybersecurity strategies to meet emerging threats. + Perform analysis of cybersecurity, intelligence and information technology policy gaps for combat systems. + Perform cybersecurity system engineering design, analysis and documentation of combat systems. + Develop cybersecurity risk assessment analysis and risk mitigation plans for combat systems. + Develop documentation of cybersecurity requirements, gap analysis, threat analysis, system engineering, risk assessment and mitigation for combat systems. + Possess an understanding of cybersecurity, military system specifications, DoD IA policies and the ability to communicate clearly and succinctly in written and oral presentations. Required Experience + Six (6) years' experience in cybersecurity requirements development, cyber threat analysis, cyber systems engineering, cyber systems architecture development or cybersecurity policy development experience. + Five (5) years' experience working with Navy combat systems such as AEGIS, Ship Self Defense System, Cooperative Engagement Capability, Ground/Air Task Oriented Radar, Solid State Laser, Railgun or other combat systems. + Minimum certification as IAT Level II per DoD 8570.01, or successor. Privileged User (Individuals who have access to system control, monitoring, or administration functions (e.g., system administrator, IAO/ISSO, system programmers, etc.)) requires that a final adjudicated Single Scope Background Investigation (SSBI) with an IT level-1 designation in JPAS must be achieved and maintained. + Navy Qualified Validator (NQV) +



**Security Clearance:**

A Top Secret clearance is required for this position. Applicant selected may be subject to a security investigation and must meet eligibility requirements for access to classified information. Job Location Hollywood, Maryland, United States Position Type Full-Time/Regular US Citizenship Required Yes Degree Required 04. B.A. Clearance Level Required 05.

**Top Secret Smartronix, Inc, Dice Id :**

10102108

**Position Id :**

1892 Have a Job? Post it

## Sr. Manager, Sr. Counsel - Cybersecurity Legal Business Counsel (3 Positions - Operations & Intelligence, Governance & Risk and ISO/Engineering/Programs)

Link to Live Job Posting: Posting is no longer active

Location: McLean, VA

O\*NET: 15-1122.00

Company: Capital One Financial Corporation

Job Title: Operations Counsels

1+ months Sr. Manager, Sr. Counsel - Cybersecurity Legal Business Counsel (3 Positions - Operations & Intelligence, Governance & Risk and ISO/Engineering/Programs) Capital One Add to Favorites Share Job Apply Now McLean 2 (19052), United States of America, McLean, Virginia At Capital One, we're building a leading information-based technology company. Still founder-led by Chairman and Chief Executive Officer Richard Fairbank, Capital One is on a mission to help our customers succeed by bringing ingenuity, simplicity, and humanity to banking. We measure our efforts by the success our customers enjoy and the advocacy they exhibit. We are succeeding because they are succeeding. Guided by our shared values, we thrive in an environment where collaboration and openness are valued. We believe that innovation is powered by perspective and that teamwork and respect for each other lead to superior results. We elevate each other and obsess about doing the right thing. Our associates serve with humility and a deep respect for their responsibility in helping our customers achieve their goals and realize their dreams. Together, we are on a quest to change banking for good. Sr. Manager, Sr. Counsel - Cybersecurity Legal Business Counsel (3 Positions - Operations & Intelligence, Governance & Risk and ISO/Engineering/Programs) The Capital One Legal Department is a place where you can showcase your talents in a fast paced, fun environment. At Capital One, you work with bright and intelligent individuals who will help elevate you to a new level. If you enjoy working on high performing teams with top talent, Capital One is the place for you! We thrive on collaboration and create an environment where everyone's voice is heard. This exciting role will allow you to use your depth and breadth of experience to strategize and influence upper management as well as the business line you support. In addition, you will have the opportunity to enhance your skills and broaden your knowledge. Come to Capital One and enjoy challenging work and an exceptional culture.

### The Roles:

At Capital One, as business counsel to the Cyber organization, you will advise and consult on initiatives, programs and projects that will raise the game in Cyber. You will counsel and educate Legal colleagues on cybersecurity and its impact to Capital One. Our Cyber Legal team is looking for 3 individuals for the following roles: Operations & Intelligence Ideal background and responsibilities within Operations & Intelligence include providing legal review and support to the teams in the cybersecurity organization focused on the following areas:

- Cyber operations, including the security operations center
- Red team and pen testing
- Cyber incident management and response and responsible disclosure program
- Cyber intelligence, including vendor assessments
- Cyber protection/fraud
- Insider threat and technical investigations teams
- Experience with United States national security and cybercrime laws
- Experience working with law enforcement a plus Governance & Risk Responsibilities within Governance & Risk include providing legal review and support to the teams in the cybersecurity organization focused on the following areas:
- Cyber governance, including policies, standards and procedures review and development
- Cyber risk and maturity assessments
- Cyber education and awareness (exercises and enterprise drills)
- Cyber compliance review, audit and regulator response
- Data governance, strategy and reporting

- Vendor and acquisition cybersecurity risk assessments
- PCI DSS compliance ISO/Engineering/Programs Responsibilities within ISO/Engineering/Program include providing legal review and support to the teams in the cybersecurity organization focused on the following areas:
- Cyber architecture and engineering, including endpoint security, perimeter protection, cloud security, data protection and cryptography services
- Vulnerability and application security management
- Cyber machine learning
- Information security officer teams supporting lines of business
- Experience with cloud technology a plus
- The successful candidate for our roles will have:
- Experience with cybersecurity standards, frameworks, risk assessments and certification processes, to include, for example: SOC 1&2, ISO/IEC 27001, 27002, 27005, the NIST Cybersecurity Framework, PCI DSS
- Experience working with public and private cyber risk organizations
- Impeccable oral and written communication skills in communicating legal and reputational risk issues to developers, engineers, analysts, and business and legal leaders
- Strategic influencing skills and the ability to drive agreement through intellect, interpersonal, and negotiation skills
- Ability to work with various teams across the Enterprise to advise on Cyber and Technology issues, including technical analysis of software products, education and training of technical teams, and analyze vendor agreements
- Ability to assist in-house and outside counsel in mitigation of cyber threats
- Willingness to sit and be embedded with your Cyber colleagues as well as engaging in close collaboration with colleagues across the Legal Department
- Ability to create a friendly and collaborative working relationships, particularly with their teammates, the rest of the legal department, internal clients, and outside counsel.

A good sense of humor is a plus!

#### Basic Qualifications:

- Juris Doctor from an accredited law school
- Active member in good standing of at least one state bar
- At least 4 years of law firm or in-house counsel experience

#### Preferred Qualifications:

- At least 1 year of legal experience supporting a technology or information security team
- Knowledge of federal and state privacy laws
- Previous government work experience
- Previous financial industry work experience
- Familiarity with the cyber threat landscape

#### Posted:

2019-11-27

#### Expires:

2020-02-08 Capital One

- [See more jobs from this company](#)
- [See more Senior Manager jobs](#)
- [Back to search results Popular Job Searches Communications Engineering Government / Military Legislative / Policy Non-Profit View All](#)

# Appendix C - Data Sources and Calculations

## Emsi Job Postings

Job postings are collected from various sources and processed/enriched to provide information such as standardized company name, occupation, skills, and geography.

## State Data Sources

This report uses state data from the following agencies: Alabama Department of Industrial Relations; Alaska Department of Labor and Workforce Development; Arizona Department of Administration, Office of Employment and Population Statistics; Arkansas Department of Workforce Services; California Labor Market Information Department; Colorado Department of Labor and Employment; Connecticut did not provide us with a data source; Delaware Office of Occupational and Labor Market Information, Delaware Wages 2004; District of Columbia Department of Employment Services; Florida Department of Economic Opportunity; Georgia Department of Labor, Workforce Information and Analysis, Occupational Information Services Unit; Hawaii Department of Labor and Industrial Relations, Research and Statistics Office; Idaho Department of Labor; Illinois Department of Employment Security, Employment Projections; Indiana Department of Workforce Development; Iowa Workforce Development; Kansas Department of Labor, Labor Market Information Services, Kansas Wage Survey; Kentucky Office of Employment and Training; Louisiana Department of Labor; Maine did not provide us with a data source; Maryland Department of Labor, Licensing and Regulation, Office of Labor Market Analysis and Information; Massachusetts Executive Office of Labor and Workforce Development; Michigan Department of Labor and Economic Growth, Bureau of Labor Market Information and Strategic Initiatives; Minnesota Department of Employment and Economic Development; Mississippi Department of Employment Security; Missouri Department of Economic Development; Montana Department of Labor and Industry, Research and Analysis Bureau; Nebraska Workforce Development; Nevada Department of Employment, Training and Rehabilitation, Information Development and Processing Division, Research and Analysis Bureau; New Hampshire Department of Employment Security; New Jersey Department of Labor and Workforce Development; New Mexico Department of Labor, Bureau of Economic Research and Analysis; New York Department of Labor, Division of Research and Statistics; North Carolina Department of Commerce, Labor and Economic Analysis Division; North Dakota Job Service, Labor Market Information Center; Ohio Department of Job and Family Services, Labor Market Information Division; Oklahoma Employment Security Commission; Oregon Employment Department, Oregon Labor Market Information System; Pennsylvania Department of Labor and Industry, Center for Workforce Information and Analysis; Rhode Island did not provide us with a data source; South Carolina Employment Security Commission, Labor Market Information Department; South Dakota Department of Labor, Labor Market Information Division; Tennessee Department of Labor and Workforce Development, Research and Statistics Division; Texas Workforce Commission; Utah Department of Workforce Services; Vermont did not provide us with a data source; Virginia Employment Commission, Economic Information Services; Washington State Employment Security Department, Labor Market and Economic Analysis Branch; West Virginia Bureau of Employment Programs, Research Information & Analysis Division; Wisconsin Department of Workforce Development, Bureau of Workforce Information; Wyoming Department of Employment, Research and Planning

## **Cybersecurity Data Analytics – Library Resources**

At this time, there are no library resources needed.

# WKU CPE Proposal Template

In addition to completing the WKU curricular steps for new programs, proponents must also submit a proposal to CPE. The CPE Proposal Template must be completed AFTER the Notification of Intent (NOI). Contact the Office of the Provost if you have questions concerning the completion of this form.

Unless otherwise noted, all questions require a response. You can duplicate answers from the NOI.

---

**Proponent:** Dr. Ray Blankenship

**Proponent's Contact Information:**

[ray.blankenship@wku.edu](mailto:ray.blankenship@wku.edu)

210-745-5952

Grise Hall #200

Western Kentucky University

Bowling Green, Kentucky 42101

**Institution:** Western Kentucky University

**Program Name:** Cybersecurity Data Analytics

**Degree Level** (Associate, Baccalaureate, Certificate, Master's, Doctorate): Master's

**Degree Designation** (AB, BS, MS, MAE, etc.): MS

**CIP Code:** 43.0404 **Cybersecurity Defense Strategy / Policy**

**Is this program an advanced practice doctorate** (highlight answer)? Yes or **No**

**Program Type** (highlight type): **Single Institution** Collaborative Dual Degree

**Proposed Implementation Date** (Semester/Year): Spring 2022

**Anticipated Date of BOR Approval:** Fall 2022

## OVERVIEW

### 1. Provide a brief description of the program with its estimated date of implementation.

This program is the study of cybersecurity defenses using data analytics to support the principles of data confidentiality, integrity, and availability. In this program, students will

learn to defend proactively and continuously improve the enterprise's security with an emphasis on using data analytics. Students will learn about the latest techniques in data management, data mining models, and data visualization. Students will also learn about cybersecurity policies and compliance issues from an information assurance and risk management perspective.

2. Does the Program have Concentrations (highlight answer)? **Yes** or No

a. If Yes, list the names of the concentrations and provide a description of each. Continue formatting for additional concentrations.

i. Concentration 1 Title and Description: **Local Government Administration**

This concentration highlights the basics of local government administration, while also addressing emerging trends in areas like e-governance.

ii. Concentration 2 Title and Description: **Organizational Communication**

This concentration provides students the opportunity to develop an in-depth understanding of how communication functions in organizations. Using foundational and current research in the field, students are exposed to organizational communication theory and processes. Students will take graduate courses that focus on general organizational communication theory, applied organizational communication, communication within specific organizational contexts, and one other course chosen by participants as especially relevant to their own work and interests. This program focuses on current research in the communication field, organizational communication theory and processes.

iii. Concentration 3 Title and Description: **Health Care Administration**

This concentration is designed to prepare students with knowledge in global engagement in health administration, health policy, health systems and service delivery.

3. Is an approval letter from the Educational Professional Standards Board (EPSB) required (highlight answer)? Yes or **No**

EPSB approval should be sought after CPE approval. Once final approval is received, send the approval letter to the Provost's Office for uploading into CPE's program inventory.

4. Is there a specialized accrediting agency related to this program (highlight answer)? Yes or **No**

a. If Yes, identify the accreditor:

b. Will accreditation be sought (highlight answer)? Yes or **No**

5. Does this program have a clinical component (highlight answer)? Yes or **No**

a. **If Yes, discuss the nature, appropriateness, and availability of clinical sites.**

**6. The following questions must be answered in a narrative format.**

a. **Identify where the program will be offered.**

The program will be delivered online and is meant to serve students in our service region or students from anywhere else in the world.

b. **Indicate the projected life of the program, if applicable (single-cohort or ongoing).**

The program is ongoing and is designed to be evolving with the demands and career needs of students. Different concentrations can be offered to meet the needs of business and society.

c. **Describe the primary target audience.**

The Cybersecurity Data Analytics program's target population is critical infrastructure workers who require a data analytics skillset to detect and prevent cybersecurity attacks.

Critical Infrastructure workers, as defined by the United States Government, work in the following fields: Communications, Chemical, Commercial Facilities, Critical Manufacturing, Dams, Defense Industrial Base, Emergency Services, Energy, Financial, Food & Agriculture, Government Facilities, Healthcare & Public Health, Information Technology, Nuclear Reactors & Materials & Waste, Transportations Systems, and Water (CISA).

CISA, <https://www.cisa.gov/publication/guidance-essential-critical-infrastructure-workforce>

d. **Describe the instructional delivery methods to be used.**

The instructional delivery for the program and each concentration is online.

e. **Describe the strength of the institution to undertake this new program.**

The Information Systems department where this program will be located currently offers a B.S. in Business Data Analytics and will offer two graduate certificates starting in the fall of 2021. The graduate certificates are in Data Analytics and Cybersecurity Data Analytics. The department also has a faculty member who is nationally recognized in the cybersecurity field and has published over 20 books in this area. The strength of the institution is its ability to capitalize and leverage the intellectual knowledge of faculty in Cybersecurity and Data Analytics to offer a graduate degree that will serve the region and beyond.

**7. Describe the rationale and need for the programs to include how the institution determined need.**



The proposed Master of Cybersecurity Data Analytics program addresses the following institutional and societal needs from Western Kentucky University's most recent strategic plan 2018- 2028, "Climbing to Greater Heights."

1. Bolster the stature and fiscal support of WKU's Graduate School and strengthen its external reputation.

The Master in Cybersecurity Data Analytics program will increase the number of graduate students and generate additional revenue for the university. Students will be able to use this program to enhance their careers by choosing to stay in Kentucky or move to another part of the country.

2. Ensure that WKU students graduate with skills to think critically, solve problems, and engage effectively with others.

The Master in Cybersecurity Data Analytics program is explicitly designed for students to think critically about data and communicate the data analysis with others.

3. Offer quality graduate programs to further lifelong learning and retraining.

The Master in Cybersecurity Data Analytics program allows students to switch to a career in Cybersecurity with minimal retraining or to build on an undergraduate degree focused on technology. This program also offers students the ability to earn two separate graduate certificates (Data Analytics & Cybersecurity Data Analytics) along with a concentration in Healthcare Administration, Organizational Communication, or Local Government Administration.

The proposed Master Cybersecurity Data Analytics program addresses the state's postsecondary education strategic agenda as listed by specific strategies from the 2016-2021 Strategic Agenda for Postsecondary and Adult Education.

- 3.2. Expand the availability of flexible, affordable, competency-based postsecondary programs, as well as strategies like employer partnerships and Project Graduate, to support working-age adults in the pursuit of job-enhancing postsecondary credentials.

The Master in Cybersecurity Data Analytics program will be delivered entirely online. Concentrations in Health Care Administration, Organizational Communication, and Local Government Administrations will allow students to pursue careers in various fields or enhance their current employment.

- 3.3. Support efforts to improve postsecondary access, workforce readiness, and the technology infrastructure of rural Kentucky.

The Master in Cybersecurity Data Analytics program is a STEM program and will improve access by being delivered online.

- 9.5. Identify current and emerging workforce demands, entrepreneurial business opportunities, and stackable credentials that can lead to additional education/training.

The graduate certificates in Data Analytics and Cybersecurity Data Analytics can be used as stackable credentials for the Master in Cybersecurity Data Analytics program. The core courses for this program are the same courses used in the graduate certificates. Once a student completes both certificates, only a nine-hour concentration will need to be completed for the master's degree.

- 9.6. Advance Kentucky's STEM and health agendas through ongoing leadership, advocacy, and collaboration.

Since the Master in Cybersecurity Data Analytics program is a STEM program and provides a concentration in Healthcare administration, it will advance Kentucky's STEM and health agendas.

Additionally, no such program exists in the state that concentrates on the defense of cybersecurity attacks through the use of data analytics.

## OBJECTIVES

### 1. Provide specific learning outcomes for the program.

At the end of the program, students will be able to:

- Identify the fundamentals of Cybersecurity from a data analytics perspective.
- Apply policies, laws, and regulations in Cybersecurity.
- Demonstrate the ability to perform vulnerability management activities

### 2. Describe how the student learning outcomes for the program will be assessed.

Assessment will take place in the core classes of the program. Projects, cases, and homework assignments will be used to collect the data for assessment. Each learning objective will be assessed once a year.

- a. Upload ASL Assessment Template ([Assurance of Student Learning Resources | Western Kentucky University \(wku.edu\)](#) Assessment Template should be reviewed by Dr. Molly Kerby prior to uploading.

### 3. Highlight any distinctive qualities of this proposed program.

This program combines cybersecurity and data analytics to provide students with the skills to prevent and detect cybersecurity attacks.

### 4. Describe the admission and graduation requirements for the program.

- a. Admission to WKU Graduate School.
- b. Applicants are required to have completed an introductory statistics course prior to enrolling in the certificate program.
- c. Applicants are required to have completed an intermediate to advanced spreadsheet class prior to enrolling.
- d. Applicants are encouraged to have completed an introduction to networking course with a C-grade or better or hold a current Security+ certification.

**5. Provide the total number of hours required for the degree.**

- a. **Program Title:** Master of Cybersecurity Data Analytics
- b. **Total number of hours required for degree:** 30
- c. **Number of hours in the degree program core:** 21
- d. **Number of hours in concentration:** 9
- e. **Number of hours in guided electives:** 0
- f. **Number of hours in free electives:** 0

**6. List courses under the appropriate curricular headings. Use the template located at: (NEED TO UPLOAD THIS TEMPLATE).**

**7. Describe administrative oversight to ensure the quality of the program.** (Who is coordinating the program and what are their credentials?)

Dr. Ray Blankenship will provide administrative oversight and quality assurance for the program. Dr. Blankenship holds a Ph.D. from the University of Mississippi in Management Information Systems. His professional development activities include the Management Development Program at Harvard University, IBM Watson Analytics Workshop, Visual Analytics Workshop Using SAS®, Applied Analytics Using SAS® Enterprise Miner, Data Manipulation and Analytics Using SAS® Enterprise Guide, and a Hierarchical Linear Models Workshop.

**8. For a program offered in compressed time frames, describe the methodology for determining that levels of knowledge and competencies comparable to those required in traditional formats have been achieved.**

The core courses for this program are offered in a bi-term format. The Assurance of Student Learning outcomes will be used to ensure the knowledge and competencies will be comparable to a traditional format. Each learning objective will be measured every other year along with annual indirect measures from the MBA program where the core courses are currently being taught as concentrations.

[Enter N/A if this does not apply to your program.](#)

## PROGRAM DEMAND/UNNECESSARY DUPLICATION

**1. Answer the following questions concerning Student Demand.**

- a. **Provide evidence of student demand. Evidence of student demand is typically in the form of surveys of potential students or enrollments in related programs at the institution, but other method of gauging student demand are acceptable.**

The core courses for this program were initially offered in fall 2020 in the MBA program as concentrations. The concentrations are Data Analytics and Cybersecurity Data Analytics. Thirty-five students enrolled in the Data Analytics concentration and eight enrolled in the Cybersecurity Data Analytics concentration. More than seventy MBA students have since elected to pursue the Data Analytics concentration. Three students are also enrolled in the Data Analytics certificate, which is outside the MBA program. We expect demand and awareness for the core course to increase once we are allowed to advertise the graduate certificates in Fall 2021.

- b. **Project estimated student enrollment and degrees conferred for the first five years of the program.**

Academic Year	Degrees Conferred	Enrollments (Headcount) – Fall Semester
2022-2023	5	10
2023-2024	10	15
2024-2025	15	20
2025-2026	20	25
2026-2027	25	30

**Please provide Gray Associates Program Evaluation System Scorecard data snapshot for new program.**

Your Dean's Office of the Office of the Provost can provide a copy of the scorecard. Consult your associate dean for training on how to interpret the information.

Data provided to WKU from Gray Associates is incomplete since the 43.0404 CIP code is new for 2020. Gray Associates does not have data concerning graduates, etc. Therefore, the following data was generated with CIP 43.0303 (Critical Infrastructure Protection, which is somewhat related to the program).

**Student Demand (88 Percentile) 3**

Category	Percentile	Criterion	Value	Score
Size	0	Inquiry Volume (12 Months)	0	0
	99	Int'l Page Views (12 Months)	33,510	NS
	0	Google* Search Volume (3 Months)	NA	NS
	85	Completion Volume	465	0
Growth	92	Inquiry Volume YoY Change (Units)	0	0
	0	Google* Search YoY Change (Units)	NA	NS
	95	Completion Volume YoY Change (Units)	155	2
	0	Inquiry Volume YoY Change (%)	NA	NS
	0	Google* Search YoY Change (%)	NA	NS
	79	Completion Volume YoY Change (%)	1	1

**Degree Fit (49 Percentile) 0**

Category	Percentile	Criterion	Value	Score
Completions		National Completions by Level	See	0
Workforce		National Workforce Ed Attainment	Below	0
NHEBI Nat'l 2 Year	0	Cost Index**	NA	NS
	0	Student: Faculty Index	NA	NS

**Inquiries and Completions**

Award Level	Inquiries (Market)	Completions (Market)	Completions (National)
Certificate	0%	5%	5%
Associates	0%	1%	1%
Bachelors	7%	41%	41%
Postbaccalaureate Certificate	0%	5%	5%
Masters	29%	47%	47%
Post-masters Certificate	0%	1%	1%
Doctoral	33%	0%	0%
Unknown	32%	0%	0%

**Competitive Intensity (62 Percentile) 3**

Category	Percentile	Criterion	Value	Score
Volume of Competition	78	Campuses with Graduates**	16	0
	97	Institutions YoY Change (Units)	7	0
	88	Average Completions/Institution	29	0
	87	Median Completions/Institution	15	0
	98	Program Size YoY Change (Units)	12	2
	96	Program Size YoY Change (%)	4	1
	92	Insts. with Program Online**	4	NS
	87	% of Institutions	27%	NS
	93	Online Completions**	64	NS
	83	% of Completions	14%	NS
Market Saturation	80	Completions per 1,000 Pop**	0.01	NS
	0	Average Cost per Inquiry**	NA	NS
	0	Google Search * Cost per Click**	NA	NS
	0	Competition Index**	NA	NS

**CIP Description**

A general program that focuses on the application of statistical modeling, data warehousing, data mining, programming, forecasting and operations research techniques to the analysis of problems of business organization and performance. Includes instruction in optimization theory and mathematical techniques, data mining, data warehousing, stochastic and dynamic modeling, operations analysis, and the design and testing of prototype systems and evaluation models.

**Job Postings (Market)**

Award Level	Minimum Education Requested
- Unspecified -	26%
High School/Certificate	6%
Associates	9%
Bachelors	57%
Masters	26%
Doctoral	21%

**BLS Workforce Edu (Nat'l)**

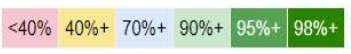
Award Level	BLS Educational Attainment
No College	4%
Some College	11%
Associates	5%
Bachelors	40%
Masters	30%
Doctoral	10%

**Employment\* (93 Percentile)**

Category	Percentile	Criterion
Size	79	Job Postings Total (12 Months)
	71	BLS Current Employment
	71	BLS Annual Job Openings
	95	Share of Generalist Employer
	95	Share of Generalist Openings
Growth	89	Job Postings YoY Change (Units)
	86	Job Postings YoY Change (%)
	69	BLS YoY Change (%)
	86	BLS 3-Year Historic Growth (CA)
	91	BLS 10-Year Future Growth (CA)
Saturation	51	Job Postings per Graduate
	35	BLS Job Openings per Graduate
Pay and Outcomes	82	10th-Percentile Wages
	90	Wages (Age < 30)
	82	Wages (Age 30-60)
	22	% with Any Graduate Degree
	37	% with Masters
	11	% with Doct/Prof Degree
	29	% Unemployed (Age <30)**
	26	% Unemployed (Age 30-60)**
	70	% in Direct Prep Jobs
	0	GE Wages - Assoc. & Cert
0	GE Placement Rate - Assoc. &	

\* - Google search, employment data and Jobs Per Grad Ratio do not include...  
\*\* - Color scale in reverse.

NA - No data available/not currently tracked. NS - Not Scored  
2-Yr - Associates & certificate programs only.



**Student Demand (97 Percentile)** **14**

Category	Percentile	Criterion	Value	Score
Size	0	Inquiry Volume (12 Months)	0	0
	99	Int'l Page Views (12 Months)	33,510	NS
	0	Google* Search Volume (3 Months)	NA	NS
	96	Completion Volume	30	10
Growth	96	Inquiry Volume YoY Change (Units)	0	1
	0	Google* Search YoY Change (Units)	NA	NS
	98	Completion Volume YoY Change (Units)	24	2
	0	Inquiry Volume YoY Change (%)	NA	NS
	0	Google* Search YoY Change (%)	NA	NS
	95	Completion Volume YoY Change (%)	4	1

**Degree Fit (49 Percentile)** **0**

Category	Percentile	Criterion	Value	Score
Completions		National Completions by Level	See	0
Workforce		National Workforce Ed Attainment	Below	0
NHEBI Natl 2 Year	0	Cost Index**	NA	NS
	0	Student: Faculty Index	NA	NS

**Inquiries and Completions**

Award Level	Inquiries (Market)	Completions (Market)	Completions (National)
Certificate	0%	49%	5%
Associates	0%	0%	1%
Bachelors	0%	51%	41%
Postbaccalaureate Certificate	0%	0%	5%
Masters	63%	0%	47%
Post-masters Certificate	0%	0%	1%
Doctoral	38%	0%	0%
Unknown	0%	0%	0%

**Competitive Intensity (9 Percentile)** **0**

Category	Percentile	Criterion	Value	Score
Volume of Competition	95	Campuses with Graduates**	1	-3
	97	Institutions YoY Change (Units)	0	0
	80	Average Completions/Institution	30	0
	84	Median Completions/Institution	30	0
	98	Program Size YoY Change (Units)	24	2
	95	Program Size YoY Change (%)	4	1
	92	Insts. with Program Online**	4	NS
	87	% of Institutions	27%	NS
	93	Online Completions**	64	NS
	83	% of Completions	14%	NS
Market Saturation	78	Completions per 1,000 Pop**	0.03	NS
	0	Average Cost per Inquiry**	NA	NS
	0	Google Search * Cost per Click**	NA	NS
	0	Competition Index**	NA	NS

**CIP Description**

A general program that focuses on the application of statistical modeling, data warehousing, data mining, programming, forecasting and operations research techniques to the analysis of problems of business organization and performance. Includes instruction in optimization theory and mathematical techniques, data mining, data warehousing, stochastic and dynamic modeling, operations analysis, and the design and testing of prototype systems and evaluation models.

**Job Postings (Market)**

Award Level	Minimum Education Requested
- Unspecified -	23%
High School/Certificate	21%
Associates	24%
Bachelors	61%
Masters	36%
Doctoral	30%

**BLS Workforce Edu (Natl)**

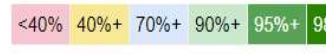
Award Level	BLS Educational Attainment
- Unspecified -	No College 4%
High School/Certificate	Some College 11%
Associates	Associates 5%
Bachelors	Bachelors 40%
Masters	Masters 30%
Doctoral	Doctoral 10%

**Employment\* (93 Percentile)**

Category	Percentile	Criterion
Size	75	Job Postings Total (12 Months)
	69	BLS Current Employment
	69	BLS Annual Job Openings
	95	Share of Generalist Employment
	95	Share of Generalist Openings
Growth	83	Job Postings YoY Change
	72	Job Postings YoY Change (%)
	60	BLS YoY Change (%)
	78	BLS 3-Year Historic Growth
	97	BLS 10-Year Future Growth
Saturation	54	Job Postings per Graduate
	46	BLS Job Openings per Graduate
Pay and Outcomes	84	10th-Percentile Wages
	90	Wages (Age < 30)
	82	Wages (Age 30-60)
	22	% with Any Graduate Degree
	37	% with Masters
	11	% with Doct/Prof Degree
	29	% Unemployed (Age < 30)
	26	% Unemployed (Age 30-60)
	70	% in Direct Prep Jobs
	0	GE Wages - Assoc. & C
0	GE Placement Rate - A	

\* - Google search, employment data and Jobs Per Grad Rate  
\*\* - Color scale in reverse.

NA - No data available/not currently tracked. NS - Not tracked  
2-Yr - Associates & certificate programs only.



CIP: 43.0303 Critical Infrastructure Protection

Market: Kentucky

Modality: All

Award Level: Certificate

Current Programs

**Student Demand (50 Percentile)**

2

**Competitive Intensity (50 Percentile)**

6

**Employment\* (26 Percentile)**

Category	Percentile	Criterion	Value	Score
Size	0	Inquiry Volume (12 Months)	0	0
	0	Int'l Page Views (12 Months)	0	NS
	0	Google* Search Volume (3 Months)	NA	NS
	0	Completion Volume	0	0
Growth	96	Inquiry Volume YoY Change (Units)	0	1
	0	Google* Search YoY Change (Units)	NA	NS
	93	Completion Volume YoY Change (Units)	0	1
	0	Inquiry Volume YoY Change (%)	NA	NS
	0	Google* Search YoY Change (%)	NA	NS
	0	Completion Volume YoY Change (%)	NA	NS

Category	Percentile	Criterion	Value	Score
Volume of Competition	0	Campuses with Graduates**	0	6
	97	Institutions YoY Change (Units)	0	0
	0	Average Completions/Institution	NA	NS
	0	Median Completions/Institution	NA	NS
	0	Program Size YoY Change (Units)	NA	NS
	0	Program Size YoY Change (%)	NA	NS
	84	Insts. with Program Online**	1	NS
	87	% of Institutions	25%	NS
	90	Online Completions**	31	NS
	98	% of Completions	89%	NS
Market Saturation	0	Completions per 1,000 Pop**	NA	NS
	0	Average Cost per Inquiry**	NA	NS
	0	Google Search * Cost per Click**	NA	NS
	0	Competition Index**	NA	NS

Category	Percentile	Criterion
Size	24	Job Postings T
	17	BLS Current E
	18	BLS Annual Jo
	49	Share of Gene
	49	Share of Gene
Growth	53	Job Postings Y
	92	Job Postings Y
	18	BLS YoY Chan
	95	BLS 3-Year Hi
	99	BLS 10-Year F
Saturation	0	Job Postings p
	0	BLS Job Open
Pay and Outcomes	75	10th-Percentile
	36	Wages (Age <
	32	Wages (Age 3)
	25	% with Any Gr
	31	% with Masters
	36	% with Doct/Pr
	70	% Unemployed
	40	% Unemployed
60	% in Direct Pre	
0	GE Wages - As	
0	GE Placement	

**Degree Fit (6 Percentile)**

-5

Category	Percentile	Criterion	Value	Score
Completions		National Completions by Level	See	-5
Workforce		National Workforce Ed Attainment	Below	0
NHEBI Natl 2 Year	0	Cost Index**	NA	NS
	0	Student: Faculty Index	NA	NS

**CIP Description**

A program focusing on the design, planning and management of systems and procedures for protecting critical national physical and cyber infrastructure from external threats, including terrorism. Includes instruction in homeland security policy, critical infrastructure policy, information security, matrix vulnerability assessment, threat assessment, physical security, personnel security, operational security, contingency planning, case analyses of specific industries and systems, redundancy planning, emergency and disaster planning, security systems, and intelligence operations.

**Job Postings (Market)**

Award Level	Minimum Education Requested
- Unspecified -	20%
High School/Certificate	17%
Associates	14%
Bachelors	65%
Masters	22%
Doctoral	12%

**BLS Workforce Edu (Natl)**

Award Level	BLS Educational Attainment
No College	4%
Some College	17%
Associates	11%
Bachelors	41%
Masters	24%
Doctoral	3%

\* - Google search, employment data and Jobs Postings  
\*\* - Color scale in reverse.

NA - No data available/not currently tracked.  
2-Yr - Associates & certificate programs only.



**Inquiries and Completions**

Award Level	Inquiries (Market)	Completions (Market)	Completions (National)
Certificate	NA	NA	5%
Associates	NA	NA	1%
Bachelors	NA	NA	15%
Postbaccalaureate Certificate	NA	NA	2%
Masters	NA	NA	77%
Post-masters Certificate	NA	NA	0%
Doctoral	NA	NA	0%
Unknown	NA	NA	0%

**2. Answer the following questions concerning Employer Demand.**

- a. Describe the types of jobs available for graduates, average wages for these jobs, and the type of anticipated openings for each type of jobs. This information was provided on the NOI.

	Regional	Regional Growth Projections	State	State Growth Projections	National	National Growth Projections

Type of Job	<b>Information Security Analyst</b>					
Average Wage	<b>\$39K-\$143k</b>		<b>\$39K-\$143k</b>		<b>\$103K \$49.80 / hour</b>	
# of Openings	<b>800</b>	<b>10%</b>	<b>800</b>	<b>10%</b>	<b>131,000</b>	<b>31% 2019-2029 (BLS)</b>
Type of Job	<b>Computer &amp; Mathematical</b>					
Average Wage	<b>\$38K Median \$69K</b>		<b>\$38K Median \$69K</b>			
# of Openings	<b>6,522 (2018-2023)</b>	<b>10%</b>	<b>6,522 (2018-2023)</b>	<b>10%</b>		
Type of Job	<b>Cybersecurity Specialist</b>		<b>Cybersecurity Specialist, Ft. Campbell Ky</b>			
Average Wage	<b>\$80K -\$123K</b>		<b>\$65K-\$85K</b>			
# of Openings	<b>Entry-level (10) Mid Level (50) Senior Level (10) Indeed.com 4/30/2021</b>	<b>10%</b>	<b>700+ Nationally</b>	<b>10%</b>		
Type of Job	<b>Cybersecurity Analyst ZipRecruiter.com</b>					
Average Wage	<b>\$70K+</b>				<b>+80K-\$145K</b>	
# of Openings	<b>121 openings statewide as of 4/30/2021 Ziprecruiter.com</b>	<b>10%</b>			<b>53,866 Ziprecruiter.com 4/30/2021</b>	<b>10%</b>

Additional demand for this type of occupation can be found in the attached EMSI data for security analyst and EMSI job posting data for analytics.

### 3. Academic Disciplinary Needs:

If the program proposal is in response to changes in academic disciplinary need, as opposed to



**employer demand, please outline those changes. Explain why these changes to the discipline necessitate development of a new program.**

The College of Business does not have a program that addresses the need for knowledgeable Cybersecurity employees. Combining the two graduate certificates, Cybersecurity Data Analytics and Data Analytics, this program will help meet the demand from employers as documented in the above table.

**4. Similar Programs: (NO ACTION REQUIRED. FOR REVIEW PURPOSES ONLY.)**

**A new program may serve the same potential student population. The proposed program must be sufficiently different from existing programs in the state or access to existing programs must be sufficiently limited to warrant initiation of a new program.**

Using the selected CIP code for the program, CPE will generate a list other programs in the state with the same CIP code. **This information was provided on the NOI and will automatically fill in this section of the proposal.** CIP code 43.0404 is new for 2020 and no other schools are using this code. Similar CIP codes for Cybersecurity were used.

**Similar Program 1:**

**Institution: Eastern Kentucky University CIP 43.0116 Program Name: Digital Forensics and Cybersecurity**

**Comparison of Objectives/Focus/Curriculum to Similar Programs:** *Explain the differences in curriculum, focus, and/or objectives. If the proposed program curriculum does not differ substantially from existing programs, then describe potential collaborations with other institutions.*

This program covers Cybersecurity from a counterterrorism perspective and does not combine it with data analytics.

**Comparison of Student Populations:** *Describe how your target student population is different from those at other institutions and explain how your program reaches this new population (e.g. the proposed program is completely online while other programs are face-to-face or hybrid).*

Our Cybersecurity Data Analytics program's target population is critical infrastructure workers who require a data analytics skillset to detect and prevent cybersecurity attacks.

**Access to Existing Programs:** *Explain how/why existing programs cannot reach your target population and/or provide evidence that existing programs do not have the capacity to meet current student demand (e.g. the number of students on enrollment waiting list).*

Existing programs are not emphasizing the use of data analytics to detect and prevent cybersecurity attacks.

**Feedback from Other Institutions:** *Summarize the feedback from colleagues at institutions with similar programs.*

**Similar Program 2:**

**Institution: Murray State      Program Name: Cybersecurity Management CIP 11.1003**

**Comparison of Objectives/Focus/Curriculum to Similar Programs:**

The emphasis of this program is to teach Cybersecurity from an Information Technology perspective. It does not integrate data analytics as a significant component for detecting and preventing digital attacks.

**Comparison of Student Populations:**

Our Cybersecurity Data Analytics program's target population is critical infrastructure workers who require a data analytics skillset to detect and prevent cybersecurity attacks. Murray State's program target population is Information Technology workers, a subset of our target student population.

**Access to Existing Programs:**

**Feedback from Other Institutions:**

**Similar Program 3:**

**Institution: Eastern Kentucky University      Program Name: MS Technology Management (Cyber Systems Technology)**

**Comparison of Objectives/Focus/Curriculum to Similar Programs:**

This program is developed for students who have an understanding of wired and wireless computer network communication.

**Comparison of Student Populations:**

Our Cybersecurity Data Analytics program's target population is critical infrastructure workers who require a data analytics skillset to detect and prevent cybersecurity attacks. EKU's target population is Networking Technology workers, a subset of our target student population.

a.

## COST AND FUNDING OF THE PROPOSED PROGRAM

- 1. Upload the budget spreadsheet. The template is available at: [Process Overview | Western Kentucky University \(wku.edu\)](#). The spreadsheet must be reviewed by the Budget Coordinator in the College, the Office of the Provost (Dr. Ladonna Hunton), and the Associate Dean prior to submission. See the cover sheet on the spreadsheet for review procedures.**

## PROGRAM REVIEW AND ASSESSMENT

In this section, you will describe program evaluation procedures for the proposed program. These procedures may include evaluation of courses and faculty by students, administrators, and departmental personnel as appropriate. Program review procedures shall include standards and guidelines for the assessment of student outcomes implied by the program objectives and consistent with the institutional mission. If you need assistance with these questions, please contact Dr. Molly Kerby in the Office of the Provost to development an assessment plan.

**1. Provide a brief description of institutional assessment processes.**

To foster a culture of continuous improvement, as well as meet SACSCOC institutional effectiveness standards, the Division of Academic Affairs employs processes of unit-level action planning and program-level learning outcomes assessment tied to institutional goals, objectives and priorities.

**2. Describe how the institution will incorporate the change (program, site, distance education, or other change) into the institution-wide review and assessment processes.**

Each year, department heads and directors establish and report progress on a set of activities intended to advance unit-level objectives and performance indicators.

Data derived from unit-level action planning and program-level outcomes assessment are used to assess the extent to which objectives/outcomes are being met, as well as develop strategies to improve the unit or program.

**3. What are the plans to evaluate students' post-graduate success?**

Plans to evaluate students' post-graduate success are to track initial employment data and follow up with a one-year post-graduation survey and a five-year post-graduation survey. The surveys will gather information about their current employment and determine the relevance of the current curriculum to their career advancement.

**SABBATICAL LEAVES**

**REQUEST:**

Approval of sabbatical leaves for faculty listed below.

**FACTS:**

Listed below are faculty members who have been recommended for sabbatical leave by the department head, College Sabbatical Advisory Committee, college dean, the Provost and President. As of academic year 2022-2023, each will have served the university for at least six continuous full academic years, hold the rank of assistant professor or above, and have submitted a compelling sabbatical application for the purpose of professional academic enrichment.

***College of Education and Behavioral Sciences***

<u>Name</u>	<u>Department</u>	<u>Period of Leave</u>
Dr. Frederick Grieve	Psychology	Spring 2023

***College of Health and Human Services***

<u>Name</u>	<u>Department</u>	<u>Period of Leave</u>
Dr. Simon Funge	Social Work	Fall 2022
Dr. Tammie Stenger-Ramsey	Kinesiology, Rec & Sport	Fall 2022

***Gordon Ford College of Business***

<u>Name</u>	<u>Department</u>	<u>Period of Leave</u>
Dr. Susane Leguizamon	Economics	Spring 2023

***Ogden College of Science and Engineering***

<u>Name</u>	<u>Department</u>	<u>Period of Leave</u>
Dr. Rodney King	Biology	Spring 2023
Dr. Tom Richmond	Mathematics	Academic Year 2022-23
Dr. Huanjing Wang	Engineering & Applied Sciences	Spring 2023

***Potter College of Arts and Letters***

<u>Name</u>	<u>Department</u>	<u>Period of Leave</u>
Dr. James Barker	History	Academic Year 2022-23
Dr. Cheryl Hopson	English	Fall 2022
Dr. Ke Peng	Modern Languages	Spring 2023
Dr. Andrew Rosa	History	Spring 2023
Prof. Marilee Salvator	Art & Design	Academic Year 2022-23

**BUDGETARY IMPLICATIONS:**

No additional resources are necessary to accommodate the sabbatical leaves. Courses usually taught by these faculty will be reassigned to other faculty members by each respective department head.

**RECOMMENDATION:**

President Timothy C. Caboni recommends awarding the above individuals sabbatical leave for the terms indicated.

**MOTION: Approval of faculty sabbatical leaves for the above recommended individuals for the terms indicated.**

---

**UNIVERSITY DISTINGUISHED PROFESSOR  
APPOINTMENT**

---

**REQUEST:** Approval of University Distinguished Professor appointment for Dr. John Cipolla, Professor of Music, effective July 1, 2022.

**FACT:** Following a review of nominations, below are faculty members who have been recommended by the University Distinguished Professorship Selection Committee and the Provost to be awarded University Distinguished Professor status effective July 1, 2022.

**Dr. John Cipolla**

Dr. Cipolla's creative activity is exemplary and is to be admired, recognized and rewarded. He has been engaged as a professional musician by some of the most prestigious organizations and venues throughout the world. Prime examples of his quantifiable musical prowess include over thirty years of professional work in New York City at Radio City Music Hall, nine years as an orchestral woodwind specialist on Broadway in Cats, and as a recording artist with leading recording companies such as NBC Television, Sony Music, ECM Records, GDE Edizioni Musicali, Nonesuch Records, MSR Classics and Centaur Records. His professional collaboration roster reads as if it were a Who's Who in the world of music. He is frequently invited and engaged to perform in countries such as Belgium, France, Italy, Spain, Bulgaria, Portugal, Costa Rica, and Peru. His creative activity supports the most coveted woodwind musical traditions and has artistically and innovatively introduced many new works to our world through performance and publication. His exploration of contemporary music and international exchange via the International Clarinet Association and the European Clarinet Association are notable and lasting contributions to his field.

No doubt due to his passion of fostering the best in music, Dr. Cipolla approaches his highly successful teaching in the same way as his personal performance; generous, methodical, specific, positive, and centered around student need. His students have consistently been leaders in departmental ensembles and have been successfully engaged as public-school music teachers in Kentucky and throughout the US. Many have been successful in pursuing performing careers such as US Military performing ensembles, while numerous students have been accepted to graduate programs and have been awarded graduate assistantships. His SITE evaluations are consistently enthusiastic and reveal that his students are highly engaged and motivated by their professor and grow to appreciate his energy and devotion. His department head evaluations also reflect his consistency and excellence in teaching.

**RECOMMENDATION:** President Timothy C. Caboni recommends the appointment of Dr. John Cipolla as University Distinguished Professor of Music effective July 1, 2022.

**MOTION**: Approval of Dr. John Cipolla as University Distinguished Professor of Music effective July 1, 2022.