# 2019 Statewide iT Challenge

## April 26, 2019

# Competition Summaries

**V.1.3    2/18/19**

| Start | End | Event/Location | | | | |
|---|---|---|---|---|---|---|
| **10:00a** | | **Registration opens** | | | | |
| 10:30a | 11:00a | **Sign-in/Registration – 101/102 Lobby** | | | | |
| 11:00a | 1:00p | NMC 241 | IFC 102 | NMC 239 | NMC 243 | IFC Bowen Commons |
| | | **CSCI** | **ITSP** | **DBMS** | **NETI** | Career Fair |
| 1:00p | 2:00p | **LUNCH - walk-up buffet / Setup rooms for afternoon competitions** | | | | Career Fair |
| 2:00p | 4:00p | NMC 239 | IFC 102 | T 332 | IFC 101 | Career Fair |
| | | **SDEV** | **SVAD** | **VISC** | **CSIA** | Career Fair |
| 4:30p | 5:00p | **Award Ceremony Setup / Finalize Scoring** | | | | Career Fair |
| 5:00p | 6:00p | **Award Ceremony** – NMC Room 438 | | | | |
| 6:00p | | Dismissal | | | | |

# Computer Programming (CSCI) Competition

A competition for teams of 1-2 undergraduate student programmers. Students are challenged to solve specific programming problems. Submissions are evaluated on applied logic, execution, error handling, and style.  Up to 18 teams may register in advance to compete (one team per Ivy Tech campus).  Programming problem solutions may be solved using Java, C++, C#, Python or Visual Basic, at the discretion of each student team. Teams will be provided laptops/workstations that have been fully configured in advance of the competition. Use of internet access or outside resources is not permitted. Time allotted to solve problems is 120 minutes minus the time used to explain the competition to competitors at the beginning of the event.

1. Student teams are explained the rules of the competition and the problem to be solved.

2. Problem is displayed on main screen.  Judges explain any nuances.

3. Teams program the solution to the problem saving to a provided thumb drive.

4. Teams are given 60, 30, 10, and 5 minute warnings.

5. Students turn completed solution on thumb drive into judges for evaluation.

6. Submission time is used solely as a tiebreaker.

## Scoring – CSCI Competition

| Points Possible | Evaluation Criteria |
|---|---|
| 650 | Does it perform the logic properly? |
| 100 | Does it compile/execute? |
| 150 | Data Validation and appropriate Error Handling |
| 50 | Readability/Annotation |
| 50 | Efficiency, Big O(n) |
| 1,000 | MAXIMUM POSSIBLE |

# Software Development (SDEV) Competition

Up to 18 teams of up to two students each (one team invited per campus) will be issued a challenge with instructions to design and develop a website using HTML5, CSS3, and JavaScript in the time allotted – a maximum 120 minutes. The specifics of the web development challenge will be posed at the beginning of the event, but will consist of a home page and at least two other pages. A judge will explain the event to the teams, including a description of the "client company", fact sheet, scoring criteria, how percent complete will be estimated, and provided graphical images that can be used on the website.

Teams will be provided with a laptop to perform their work and will save their work on a provided flash drive and turned in at the end of the event.  The flash drive will contain the graphical images allowed to be used in designing the website, including the company's logo.

The website is to be designed attractively and professionally, and will include user interaction and forms.  Time remaining warnings will be provide at 60, 30 10 and 5 minutes remaining. At one minute remaining, teams will be instructed to save their work and close their files on the provided flash drive.

Students will be allowed to bring a MAXIMUM of three published and unedited reference materials on the subjects of HTML, CSS, and JavaScript, which WILL BE REVIEWED by the event administrators prior to the start of the competition.  Attempts to bring in your own notes or other materials of that nature will result in disqualification.

Competition Steps:

1. Teams are given the specific business need to be reflected in the web site and the graphic images that can be used.

2. Teams develop a home page and two other subpages using HTML5, CSS3, and JavaScript within the allotted 120 minutes (estimated 110 minutes of development time).

3. Teams save their work on the provided flash drive and turn it in to be judged.

## Scoring – SDEV Competition

| Points Possible | Evaluation Criteria |
|---|---|
| 200 | Use of Graphics and Web Technology |
| 300 | Overall Design and Layout, Look and Feel |
| 250 | Correct and Complete Functionality |
| 250 | Programming Code Style and Structure |
| 1,000 | Maximum Possible |
| x % | Percent Complete |
| X,XXX | MAXIMUM POSSIBLE |

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# Database Management (DBMS) Competition

A maximum of 10 student teams of up to 2 members each (no more than 2 teams per campus) will be given a database with 10 tables on a flash drive. From these tables each team will be required to answer 10 select statement questions, prepare one business briefing, and 5 graphs. Teams will be scored on obtaining the correct results and presenting the results to a fictitious Chief Information Officer. This will include providing accurate information gleaned from the data, graphs (in Excel, Google Sheets, or Open Office) developed by the team to explain their findings, and business recommendations by the team as a result of their business analysis.

Competition Steps:

Judges (Board of Directors):

1. The BOD will distribute flash drives with Excel spreadsheets and comma separated values files containing the raw data for the Database and Business Analytics Teams.

2. An executive request from the CIO for analysis of the current business has been sent to the database team for the upcoming BOD meeting.

Students (Database and Business Analytics Teams):

1. Teams will be required to import data from Excel worksheets or comma separated values files, figure out the table relationships by creating an ERD on the provided flash drive. (Note: ERD should show at least cardinality means one to many, one to one, or many to many relationship)

2. Teams will answer the requested business analytics questions posed by the CIO on the data and create 5 graphics to assist explaining the analysis and recommendations on the provided flash drive.

3. Teams will submit business briefing document to the CIO on the provided flash drive, including answers to questions and created graphics.

## Scoring – DBMS Competition

| Points Possible | Evaluation Criteria |
|---|---|
| 500 | Importing data and building relationships including ERD (GIGO) |
| 300 | Business analysis to the executive request (10 @ 30 points each) |
| 150 | 5 graphics including analysis and recommendations (5 @ 30 points each) |
| 50 | Business Briefing |
| 1,000 | MAXIMUM POSSIBLE |

**COMPETITION SUMMARIES**

# IT Support (ITSP) Competition

Against the clock, up to 18 student teams of up to two people each will be given the components and software to assemble a Microsoft machine, install VMware, and then install a Linux virtual machine on the same computer.  Once physical assembly is completed, each team must configure Windows and Linux operating systems as well as production and application software identified and provided by the judges.  Teams will be competing against each other as well as the approximate two-hour time limit. Each team's performance will be timed by a separate judge.

Competition Steps:

1. Assembly – Teams assemble one computer from provided parts
2. OS Installation – Teams will install Windows 10 on the assembled physical machine; on a provided laptop, teams will install VMWare and Red Hat Linux as a virtual machine.
3. OS Configuration – Team will complete a provided list of configuration settings for the operating systems including but not limited to created administrative accounts, setting up network connectivity and joining an Active Directory Domain.
4. Program Installation – Teams will map a network drive to a shared folder to locate and install antivirus software (AVG) and application software (Apache Open Office from OpenOffice.org)
5. Security Implementation – Teams will configure the antivirus software and Operating Systems per provided security instructions on the Windows computer.

## Scoring – ITSP Competition

| Points Possible | Evaluation Criteria |
|---|---|
| 500 | Successful completion of Task 1 |
| 500 | Successful completion of Task 2 |
| 500 | Successful completion of Task 3 |
| 500 | Successful completion of Task 4 |
| 500 | Successful completion of Task 5 |
| 3,600 | 3,600 minus elapsed time in seconds |
| 6,100 | Maximum Raw Score |
| X 0.1639 | Convert to 1,000 scale |
| 1,000 | MAXIMUM POSSIBLE |

# Network Infrastructure (NETI) Competition

Up to 18 teams of up to 2 students each will attempt to complete ten (10) networking tasks based on the CISCO CCENT and CCNA Routing & Switching certifications (NETI 105, NETI 115, & NETI 205).  There are six (6) Base Performance tasks scored on completion quality plus four (4) Advanced Configuration Tasks, scored on completion quality. The maximum performance time is two hours, minus any administrative time up front.  The competition tasks are as follows:

BASE PERFORMANCE TASKS
1. Design and Document IPv4 & IPv6 Host Scheme

2. Basic Configuration w/Security Routers

3. Configure Static and Default Routing

4. Summarize T

5. Basic Configuration w/Security – Switches

6. Build Networks including VLANs, Router on Stick


ADVANCED CONFIGURATION TASKS (in any order)
7. Configure DHCP & DNS

8. Configure ACL's for IPv4 and IPv6

9. Configure Spanning-Tree

10. Configure OSPF

## Scoring – NETI Competition

| Points Possible | Evaluation Criteria |
|---|---|
| 600 | 6 Base Tasks |
| 100 | Advanced Confirmation Task 7 |
| 100 | Advanced Confirmation Task 8 |
| 100 | Advanced Confirmation Task 9 |
| 100 | Advanced Confirmation Task 10 |
| 1,000 | MAXIMUM POSSIBLE |

# Server Administration (SVAD) Competition

A maximum of 18 student teams of up to 2 members each will compete against the clock to build and establish Windows and/or Linux servers with a central authentication system such as Microsoft Active Directory Network or Linux equivalent including Kerberos with LDAP or FreeIPA to the specifications listed. Teams will perform Basic Tasks and Advanced Tasks, with points awarded for successful completion of each task and a time score for the completion of each task. A judge assigned to each team will time their performance. Blended teams from a variety of campuses will be encouraged.

Basic Tasks:
1.  (100 pts) Configure Active Directory Services on a Windows Server 2016 Installation
2.  (100 pts) Install and configure DNS and DHCP services
3.  (100 pts) Set up one printer service which prints a test page from the same system
4.  (100 pts) Create standard staff user accounts using a CSV file using the dsadd command or PowerShell, configuring organizational units/groups
5.  (100 pts) Create shared folders, setting permissions on folders, creating groups and applying for assigned permissions

Advanced Tasks:
6.  (100 pts) Restore data from backup
7.  (200 pts) Install and configure a web service
8.  (300 pts) Install and configure a SQL service
9.  (100 pts) Create a Windows share folder on the Linux server, allowing the Windows users to be able to Read, Write, and Execute file from the folder.
10. (200 pts) Establish permissions with Linux-based and Windows-based servers using single authentication.
11. (100 pts) Print a specific document from one OS environment to the other OS print service located on a Group folder location from the restored backup (specified at the time of the event)

Scoring – SVAD Competition

| Points Possible | Evaluation Criteria |
|---|---|
| 500 | Completion of Basic Tasks @ 100 points each |
| 100 | Completion of Advanced Task #6 |
| 200 | Completion of Advanced Task #7 |
| 300 | Completion of Advanced Task #8 |
| 100 | Completion of Advanced Task #9 |
| 200 | Completion of Advanced Task #10 |
| 100 | Completion of Advanced Task #11 |
| 1,500 | Maximum Completion Raw Score |
| X 0.667 | Convert to 1,000 scale |
| X,XXX | MAXIMUM COMPLETION SCORE |
| + up to 3,000 time pts | 3,000 minus elapsed seconds = Max Time Score |
| X,XXX | TOTAL SCORE |

Time Score is measured as elapsed time to complete all 9 tasks in seconds, subtracted from 6,000 seconds (100 minutes)

# Cyber Security / Information Assurance (CSIA) Competition

Up to 18 teams of up to 2 students each will compete, based upon the NCL National Cyber League competition supported by CSSIA.org on the Cyber Skyline Platform. Students will be given open internet access during this competition in order to research the questions posed. The CSIA Competition will consist of the following 4 domains, performed within two hours.

I. **Open Source Intelligence** (OSINT) uses 2 Challenges 11 Questions: Help the police extract information using publicly available data and tools.

II. **Cryptography** uses 4 Challenges 6 Questions: Information is key, but it's not going to be easy to get it. Decipher these hidden messages to learn what is really going on.

III. **Log Analysis** 3 Challenges 25 Questions: Logs hold a ton of information. The hard part is using them to learn what happened. Analyze these logs to determine what the hackers have been up to.

IV. **Network Traffic Analysis** 4 Challenges 26 Questions: Determine what happened and exactly when it happened by looking at network traffic captures.

COMPETITION STEPS:

1. Use online search engines to answer (OSINT) questions and analyze Email Header.

2. Use Basic Cryptography techniques substitution, transposition, and Conversions.

3. Use Advanced Cryptography techniques, and scripting to crack encrypted code.

4. Use Online SQL Database viewer to analyze Firefox history database.

5. Use Kali Linux CLI Commands to extract information from a log file.

6. Use Wireshark to analyze PCAP file and answer questions about FTP, DNS, and HTTP.

7. BONUS Task: Privilege Escalation Challenge. Use provided software of your own choosing to bypass the operating system login screen.

## Scoring – CSIA Competition

| Points Possible | Evaluation Criteria |
|---|---|
| 110 | **Open Source Intelligence** (OSINT) 2 Challenges 11 Questions (10 pts) per question |
| 120 | **Cryptography** 4 Challenges 6 Questions (20) pts per question |
| 500 | **Log Analysis** 3 Challenges 25 Questions (20) pts per question |
| 260 | **Network Traffic Analysis** 4 Challenges 26 Questions (10 pts) per question |
| 1,000 | TOTAL |
| 100 | BONUS Task – Privilege Escalation Challenge |
| 1,100 | **MAXIMUM POSSIBLE** |

# Visual Communication (VISC) Competition

Up to 14 student teams of up to two students each are challenged to create an advertising layout for a supplied common commercial product. Competitors will be required to take a photograph of the product and edit/manipulate it in Adobe Photoshop. They will also be required to create some form of visual identity (wordmark/logo) for the product using Adobe Illustrator. Finally, they will place both the Photoshop image(s) and the Illustrator art in Adobe InDesign and composite the final magazine advertisement layout. Competitors will compete against the clock and complete all of these tasks in approximately 110 minutes.

Competition Steps

1. Examine the given product and research/brainstorm ideas for the product identity and magazine advertisement.

2. Complete ideation sketches for the visual identity and the finished layout.

3. Take photo(s) of the product and edit in Adobe Photoshop.

4. Develop a wordmark/logo for the product in Adobe Illustrator.

5. Composite all design elements (photo(s), identity, text, other) in Adobe InDesign

Specifications for the final document:

- Must be either full page (letter sized) or full spread (tabloid sized)

- Must include .psd of photo(s), .ai of logo/wordmark, and any typography done in .indd

- File must be correctly packaged using InDesign

## Scoring – VISC Competition

| Points Possible | Evaluation Criteria |
|---|---|
| 50 | Concepts & Ideation Sketches |
| 300 | Creativity & Evidence of Design Principles |
| 200 | Photo Editing/Manipulation in Photoshop |
| 200 | Logo/Wordmark in Illustrator |
| 200 | Layout & Typography in InDesign |
| 50 | All specifications met |
| 1000 | MAXIMUM POSSIBLE |