

**Information Technology Discipline  
Program Learning Goals Assessment**

Prepared May 15, 2017 by William Madden, Associate Professor, Information Technology Discipline

**Abstract:**

Results and analysis of surveys designed to elicit feedback from students in all programs of study falling within the purview of the Information Technology discipline are presented. The survey questions presented each of the published Program Learning Goals for each program of study, along with a Likert Scale asking students to assess the degree to which they perceive their particular program of study has helped prepare them to meet each Program Learning Goal.

**Introduction:**

The Information Technology discipline is comprised of 11 programs of study. Each program has its own set of Program Learning Goals (initially defined and published in 2013 and included in the attached file: INF\_MEDINFO\_GAM\_ProgramLearningGoals\_CurriculumMaps.xlsx).

**Survey Development and Dissemination:**

It was decided that surveys should only be conducted in ‘capstone’ computer laboratory-based courses (that is, 200-level courses that occur at, or near, the end of particular courses of study and, ideally, would be unique to those courses of study, and that, additionally, are taught in computer labs for reasons that become clear below). We used the Information Technology discipline Curriculum Map (initially defined and published in 2013 and also included in the Excel file referenced in the paragraph above).

In one case, the identified capstone course also functioned as a capstone for other courses of study. In this case, individuals were asked to self-identify their particular course of study and the appropriate survey was targeted to them within the class. Example: INF-218 is a capstone course for AAS.MED.INFO, CERT.DB, and CERT.OFF.TECH majors. The instructor of the class provided one web link for the AAS.IT.DB majors and two other web links for the CERT.DB and CERT.OFF.TECH majors. In all cases, the surveys were administered in class during the 14<sup>th</sup> week of the semester, by having students click into a provided web link for their particular survey.

Seven survey instruments were developed and disseminated. The creation and deployment of the surveys occurred in the weeks leading up to April 29, 2017 (end of the week prior to the 14<sup>th</sup> week of the semester). The seven surveys were placed online using Google Forms. We used TinyURL to shorten the URLs, making them much easier for teachers to post (and for students to find) in class. Emails were sent out to instructors in these courses, requesting that they have the students log in and take the surveys during class (hence the need for these to be laboratory-based courses).

The seven web links provided were:

- For INF-239 (AAS.IT.DB majors): <http://tinyurl.com/m3k2664>
- For INF-257 (AAS.IT.NET majors): <http://tinyurl.com/kblm777>
- For INF-208( AS.PS.INFO majors): <http://tinyurl.com/m3dovcm>
- For INF-228 (AAS.BT.OFF.TECH majors): <http://tinyurl.com/kf55gke>
- For INF-218 (AAS.MED.INFO majors): <http://tinyurl.com/kp4awme>
- For INF-218 (CERT.DB majors): <http://tinyurl.com/mbywuuy>
- For INF-218 (CERT.OFF.TECH majors): <http://tinyurl.com/mhqadw7>

This Spring 2017 semester we did NOT administer surveys in the following majors: AAS.IT.WEB, AAS.SD.GAME.PGMG, AAS.SD.GAME.TEST, CERT.COMP.SUPPORT or COA.NET.SECURITY. This is because the relevant capstone courses are not offered in the Spring semester. We will be canvassing these majors in Fall, 2017.

**Data Collection and Tabulation:**

Responses were tabulated on May 15, 2017, following the end of the spring semester. We recorded 40 responses across all the programs of study, broken down as follows:

- AAS.IT.NET – 16 responses
- AS.PS.INFO – 12 responses
- AAS.IT.DB – 8 responses
- AAS.MED.INFO – 2 responses
- CERT.DB – 1 responses
- CERT.OFF.TECH – 0 responses
- AAS.SD.GAME.PGMG – 1 response (from Fall 2016, see explanation below)

The response rate in the first three programs was high enough to provide the basis for meaningful analysis. The response rate in the remaining four programs was quite low and is not likely to yield much in the way of meaningful analysis, beyond implementing strategies that yield a higher response rate, if possible.

Regarding the three programs with significant response rates, the table below presents, in the broadest possible terms, student perceptions of programs within the INF discipline:

**Table 1: AS.PS.INFO, AAS.IT.DB and AAS.IT.NET in aggregate (N = 36)**

These programs meet their Program Learning Goals (60-100%)	62%
These programs are neutral with respect to reaching their Program Learning Goals (40-60%)	18%
These programs do not meet their Program Learning Goals (0-40%)	20%

By individual program, here is how the responses break down

**Table 2: AS.PS.INFO (N = 12)**

This program meets its Program Learning Goals (60-100%)	67%
This program is neutral with respect to reaching its Program Learning Goals (40-60%)	23%
This program does not meet its Program Learning Goals (0-40%)	10%

**Table 3: AAS.IT.DB (N = 8)**

This program meets its Program Learning Goals (60-100%)	78%
This program is neutral with respect to reaching its Program Learning Goals (40-60%)	13%
This program does not meet its Program Learning Goals (0-40%)	9%

**Table 4: AAS.IT.NET (N = 16)**

This program meets its Program Learning Goals (60-100%)	51%
This program is neutral with respect to reaching its Program Learning Goals (40-60%)	16%
This program does not meet its Program Learning Goals (0-40%)	33%

With regard to individual Program Learning Goals within each of the three programs of study, here are the responses:

**Table 5: AS.PS.INFO (N = 12)**

	Our graduates are able to write applications in at least two current industry-standard computer languages.	Our graduates are able to perform a complete systems analysis and design for computing technology systems used in the workplace.	Our graduates are able to transfer to 4-year programs of study in Information Technology.	Our graduates can use standard business productivity software to support electronic projects.
Meets PLG 80-100%	8.3%	8.3%	41.7%	33.3%
Meets PLG 60-80%	50%	50%	33.3%	41.7%
Meets PLG 40-60%	16.7%	33.3%	25%	16.7%
Meets PLG 20-40%	8.3%			
Meets PLG 0-20%	16.7%	8.3%		8.3%

**Table 6: AAS.IT.DB (N = 8)**

	Our graduates are able to write application programs that use standard industry APIs to create, delete and update information in enterprise databases.	Our graduates are able to design, develop, test and deploy complete custom applications for a variety of platforms (from mobile devices to desktop environments).	Our graduates are able to use standard commercial and/or open-source development environment tools to write applications.	Our graduates can use standard business productivity software to support electronic projects.
Meets PLG 80-100%	12.5%	12.5%	37.5%	37.5%
Meets PLG 60-80%	75%	37.5%	50%	50%
Meets PLG 40-60%		25%	12.5%	12.5%
Meets PLG 20-40%		25%		
Meets PLG 0-20%	12.5%			

**Table 7:** AAS.IT.NET (N = 16)

	Our graduates are able to design, implement and administer local area networks, metropolitan area networks, and wide area networks.	Our graduates are able to install, configure and maintain server and client operating systems including Windows and Linux, and effectively conduct management responsibility of network resources including users, printers, file shares and multiple network-related objects.	Our graduates will be able to write and present infrastructure and application-related project plans and graphs supported by realistic budgets and network configuration resources while working under time constraints.	Our graduates can use standard business productivity software to support electronic projects.	Our graduates are able to step in to any IT environment and conduct an infrastructure and security assessment based on solid knowledge of the IP protocol and make significant improvement recommendations.
Meets PLG 80-100%	18.8%	12.5%	18.8%	18.8%	18.8%
Meets PLG 60-80%	31.3%	50%	25%	31.3%	31.3%
Meets PLG 40-60%	18.8%	12.5%	12.5%	18.8%	18.8%
Meets PLG 20-40%	6.1%	6.1%	18.8%	12.5%	6.1%
Meets PLG 0-20%	25%	18.8%	25%	18.8%	25%

### **Analysis and Discussion:**

Overall, students' perceptions of three of the Information Technology disciplines (AS.PS.INFO, AAS.IT.DB and AAS.IT.NET) are positive. Nearly two-thirds (62%) of them 'Agree' or 'Strongly Agree' that these three programs are meeting their published Program Learning Goals (PLGs). About 1 in 5 (20%) 'Disagree' or 'Strongly Disagree' that these three programs are meeting their PLGs. The remainder, about 1 in 6 (18%) are 'Neutral', meaning that, for them, the three programs are meeting their PLGs about 40-60% of the time.

Of the three programs, AAS.IT.DB is perhaps the most successful: 78% of respondents 'Agree' or 'Strongly Agree' that the program is meeting its PLGs and only 9% 'Disagree' or 'Strongly Disagree' that the program is meeting its PLGs. 1 in 8 (13%) are 'Neutral'.

AS.PS.INFO is nearly as successful. Only 10% 'Disagree' or 'Strongly Disagree' that it meets its PLGs (quite similar to AAS.IT.DB). A larger 23% are 'Neutral' in their responses, while two-thirds (67%) 'Agree' or 'Strongly Agree' that it meets its PLGs.

AAS.IT.NET has half of its respondents (51%) who 'Agree' or 'Strongly Agree' that it meets its PLGs. A third (33%) 'Disagree' or 'Strongly Disagree' that it meets its PLGs, with about 1 in 6 (16%) reporting 'Neutral'.

It is preliminary to draw firm conclusions from these results. Although we are pleased with the response rates on these three surveys, the overall numbers are still small enough that we will want to collect more data over time to see if what appear to be trends in the data are truly significant.

With that important caveat, the responses appear to indicate that the three programs (AS.PS.INFO, AAS.IT.DB and AAS.IT.NET) are largely successful in meeting their Program Learning Goals. Is there any significance regarding the negative responses from those surveyed in the AAS.IT.NET program (33% or roughly 5 of the 16 individuals surveyed)? It is certainly something to note as we move forward with the program but, again, we need to collect more data to see if there is a significant trend.

Though we did not receive many comments, there is likely some 'food for thought' in what we did receive. Three similar comments came from AAS.IT.NET majors. Two comments directly expressed a desire for more hands-on courses (and less reliance on simulated environments such as Testout and the use of virtualization). The third comment was not very specific, but that particular respondent provided contact information, volunteering to work with us on curriculum ideas. We will reach out to him.

There were four additional responses spread across three more programs. In one case, we included the sole respondent we had when we administered a similar set of surveys in Fall 2016. It is very difficult to draw any conclusions from the very low response rate, other than to strategize ways to improve the response rate the next time around. We did not make responding to the surveys a required task in any of the classes; rather we prevailed upon the good will of the particular instructors involved to encourage the students to take a few minutes right then and there in class to fill out the surveys.

### **Next Steps:**

In the INF discipline we are always exploring ways to improve the quality of our programs, particularly with regard to the amount of hands-on and/or workplace-environment activity that takes place in our

classrooms. A very important next step is occurring this summer 2017. We are building out a brand-new hands-on lab, specifically with our AAS.IT.NET and programming-oriented majors (AAS.IT.DB, AAS.IT.WEB, AAS.PS.INFO, AAS.MED.INFO, CERT.DB, AAS.SD.GAME.PGMG and AAS.SD.GAME.TEST) in mind. The new lab is specially-equipped with networking infrastructure equipment: multiple racks, servers, routers and network switches, as well as student workstations outfitted with multiple network connectivity options. This design will allow students to experiment directly with configurations, installations and troubleshooting scenarios identical to what they will encounter in workplace settings. Though it is tempting to claim that this opportunity is a result of this particular INF assessment, it really arose through a combination of fortuitous circumstances, though it was driven by our own ongoing desire to improve the quality of students' experiences in the classroom. Nevertheless, it is gratifying to see that this very significant event aligns very well with what is suggested by the INF assessment.

This current cycle of the INF assessment has already prompted informal discussion about its possible significance. We will incorporate the assessment results and these discussions in our more formal work throughout the year, as part of continual, ongoing program review and improvement.

We will repeat this assessment process next semester to canvas the programs that did not participate this semester because they only offer the appropriate 'capstone' courses in the Fall semester. We will also 'fine tune' the administration of the surveys in two ways: (1) we will work to have the instructors require survey completion and (2) we will administer the survey about two weeks earlier in the semester (still toward the end of the course, but not so close to finals week).

We will repeat this process each semester, gradually assembling a larger and more meaningful data set as we go. Of course, as in any situation where measurement of human behavior over time is involved, we have a set of moving targets (the programs themselves are very dynamic). As our objectives, materials, methods and substance improve, we fully expect our analyses and outcomes to become more nuanced and challenging.

For the sake of completeness, I include below (Tables 8, 9 and 10) the tabulated data for the 4 additional responses from this round of surveys. Again, since the response rate is so low, I have not included the data in the analysis above.

**Table 8:** AAS.MED.INFO (N = 2)

	Our graduates are able to use standard industry tools to design, create, delete and update electronic databases.	Our graduates are able to use technology resources that help to transform analog (paper-based) records into searchable electronic records.	Our graduates use standard medical and pharmacology terminology, and coding, medical and ethical practices.	Our graduates can use standard business productivity software to support electronic projects.
Meets PLG 80-100%			50%	
Meets PLG 60-80%	100%	100%	50%	100%
Meets PLG 40-60%				
Meets PLG 20-40%				
Meets PLG 0-20%				

**Table 9:** CERT.DB (N = 1)

	Our graduates are able to write application programs that use standard industry tools to create, delete and update information in enterprise databases.	Our graduates can use standard business productivity software to support electronic projects.
Meets PLG 80-100%		
Meets PLG 60-80%	100%	
Meets PLG 40-60%		100%
Meets PLG 20-40%		
Meets PLG 0-20%		

**Table 10:** AAS.SD.GAME.PGMG (N = 1) – data collected in December, 2016

	Our graduates are able to complete pre-production planning and design documents needed for video-game development.	Our graduates are able to design and develop video-game applications using standard commercial and open-source development products.	Our graduates are able to design and develop audio-visual assets for video-games using standard commercial and open-source development products.	Our graduates can use standard business productivity software to support electronic projects.
Meets PLG 80-100%				
Meets PLG 60-80%				
Meets PLG 40-60%	100%			
Meets PLG 20-40%		100%	100%	100%
Meets PLG 0-20%				