# Concept Paper for the proposed NTID Associate of Science in Applied Networking

## I. Title/Department/College

**Associate of Science in Applied Networking**

Information and Computing Studies department, National Technical Institute for the Deaf (NTID)

## II. Goals and Justification for the Proposed Program

NTID’s Information and Computing Studies (ICS) department proposes a new AS degree program in Applied Networking. The goal of this program is to continue a practice that was already in place in the quarter system that allowed for an effective and efficient transition from the ICS Applied Computer Technology (ACT) AS degree program to Golisano College of Computing and Information Sciences (GCCIS)’s Networking and Systems Administration (NSA) program in the Information Science and Technologies (IST) department.

There is a growing number and proportion of NTID supported students who are entering RIT baccalaureate programs. The 2012 NTID Annual Report shows that more than 40% of the student enrollment through NTID is in baccalaureate programs. Additionally, NTID Admissions reports that roughly six out of seven students entering NTID have aspirations beyond an associate level degree. The proposed AS in Applied Networking is in line with both of these trends since it provides opportunities for students to start at NTID, enhance their skills and transition to a baccalaureate program in the NSA field.

The ICS department has had a long and successful relationship with the IST department and specifically with two programs in that department, Information Technology (IT) and NSA. In 2003, an AS degree was approved that allowed students to transition to either the IT or NSA program since the first two years of those baccalaureate programs were very similar. However, when the new semester curriculum was developed for IT and NSA, it became apparent that the programs had taken such significantly different directions that one AS degree was no longer sufficient to transition ICS students to both degree programs. Given that the majority of our AS students were interested in transferring to the IT program, for semester conversion purposes, in 2011, the ICS curriculum team made the decision to convert our AS degree to provide a transition to the IT degree program. However, this has left a significant number of students without an effective transition path to an NSA degree.

Historically, approximately 30% of the ICS students that transfer to a baccalaureate program have chosen to transfer into the NSA program. It therefore makes sense to develop an AS program specifically designed to transition students into the NSA program.

Since the proposed AS in Applied Networking is designed as a transfer degree not a terminal degree, market need for this program will be driven by student demand. History has shown sufficient student demand for this program. Further, demand can be tied to the job market which is projected to be very favorable. For Network and Computer Systems Administrators, the 2010-2020 job outlook, published in the Bureau of Labor Statistics Occupational Outlook Handbook, estimates a 28% (faster than average) growth rate.

## III. Description of the New Program

The ICS curriculum team has worked diligently with the NSA program coordinator to develop a strong four-semester AS degree program as well as an articulation agreement that allows for smooth and efficient transition into the NSA program with minimal loss of credits. It is designed with 61 total credits, 31 of those dedicated to liberal arts and sciences, and 30 dedicated to the major. 59 of the 61 total credits, or almost 97% will articulate directly to the NSA program. Although this degree is designed and intended as a transfer degree, the skills attained are sufficient for entry level employment as a computer network support specialist (or similar title) should a student choose or be unable for any reason to continue for a full baccalaureate degree in the NSA program.

The first semester contains the same courses as the approved semester ACT AS degree (that allows for transition to the IT program). In that semester, students gain foundational skills in Math and English as well as in three technical courses that include foundational skills in programming, web development, and basic networking and security. Semesters 2-4, build on those skills and allow students to take fewer technical courses in NTID/ICS, and more courses that are required and taught as part of the GCCIS/NSA curriculum. One three-credit course from the Information Security and Forensics (ISF) program in GCCIS is also included in semester 2.

The AS curriculum team has identified skills needed to successfully transition into the more rigorous courses in NSA. We know that learning programming languages for example, is difficult for our students so we have chosen to replace the first required NSA programming course (ISTE-100 Computational Problem Solving in the Networking Domain) with a two-course programming sequence (NACA-160 Programming Fundamentals I and NACA-162 Programming Fundamentals in the Networking Domain) to help build a solid foundation in programming. The AS program will also include an NTID bridging physics course (NSCI-270) which helps prepare students for the more rigorous two-semester COS College Physics sequence (PHYS-111 and 112) required in the third year of the NSA program.

Only one new course will need to be developed and taught for this proposed curriculum: Programming Fundamentals in the Networking Domain. All other courses are required and offered as part of other degree programs. The distribution of credit hours for the proposed AS degree in Applied Networking is shown below.

**Distribution of Credit Hours**

Liberal Arts, Math/Science

Liberal Arts 22

Math/Science (COS) 3

Math/Science (NTID) 6

Technical

ICS Program Requirements/Electives (NTID) 18

Credits from NSA Program (GCCIS) 9

Credits from ISF Program (GCCIS) 3

 **Total Credits Required for Graduation 61**

## IV. Fit with RIT Academic Portfolio Blueprint Characteristics and Criteria

Examples of how the proposed program fits the Academic Portfolio Blueprint characteristics and criteria are outlined below.

 **Characteristics:**

* **Synergy and Interdisciplinarity:**

The first semester of this AS degree program in Applied Networking contains the same courses as the first semester of our current AS degree program in Applied Computer Technology that transitions to the IT program. We have developed semesters 2-4 in collaboration with the GCCIS/NSA program so that available course offerings provide maximum benefit for successfully transitioning from the NTID/ICS program to the NSA program.

* **Inclusive Excellence:**

NTID students will take general education coursework in another college of RIT and as early as their second semester, will start taking coursework with hearing students in the GCCIS/CSEC and NSA program thus adding to the diversity of student experiences in those classes.

 **Criteria:**

**I. Centrality:**

 According to the RIT Mission: “The RIT community engages and motivates students through stimulating and collaborative experiences. Our mission is to provide technology-based educational programs for personal and professional development.”

The proposed program will “motivate and engage students” to pursue a BS degree in Networking and System Administration “for personal and professional development” who would not otherwise have that opportunity.

**II. Marketability:**

The proposed AS in Applied Networking is designed as a transfer degree so market need for this program will be driven by student demand for a BS in RIT’s Networking and Systems Administration program. From 2003 to 2012 when the AS transfer to NSA was available, 6-9 students annually enrolled in the AS to NSA degree program. Further, the job market for Networking and Systems Administrators is projected to be very favorable. For Network and Computer Systems Administrators, the 2010-2020 job outlook, published in the Bureau of Labor Statistics Occupational Outlook Handbook, estimates a 28% (faster than average) growth rate.

## V. Synergy with Other Programs

The first semester of this AS degree program in Applied Networking contains the same courses as the first semester of our current AS degree program in Applied Computer Technology that transitions to the IT program in GCCIS. We have developed semesters 2-4 in collaboration with the GCCIS/NSA program so that available course offerings provide maximum benefit for successfully transitioning from the NTID/ICS program to the NSA program.

## VI. Administrative Structure for the New Program

The administrative structure of the proposed program will follow the standard administrative structure of the Institute. There will no new administrative roles created for the proposed program. The ICS chair will work as needed with the program coordinator relative to administrative duties such as course scheduling, faculty assignments, and program budget.

## VII. Enrollment Management Expectations and Sustainment

Each year, ICS admits 10-15 students into the AS degree program. Another 10-15 students from the career focused (AOS or AAS) degree programs improve their skills and take the necessary courses to transition to the IT or NSA program. Approximately 30% of the combined number, (20-30 students), have chosen to enter the NSA degree program. Therefore we anticipate enrollment of eight students each fall semester beginning the first year, with six students returning each fall semester of their second year (showing a 75% retention rate). We anticipate that 5 students will remain throughout their NSA degree program in GCCIS and graduate with a BS degree.

For AY 2006-07 through 2010-11, 59 students were enrolled in the ICS AS-ACT program. Of those 59, 15 have graduated, 24 are still registered in a program and 19 have left the institute. Since the AS program inception in 1995 until today, there have been 142 AS students. 46 have graduated, 46 are still registered in a program and 50 have left the institute. We anticipate that the path to NSA provided by this NTID AS program will lead to persistence and graduation rates at least as good as the historical data.

The enrollment projections were reviewed by Dr. Jim Miller, Sr. Vice President, Enrollment Management and Career Services, who expressed support for the program and noted that “You have only accounted for two years of full-time study at NTID with assumption that all will complete AS Degree in two years. In all likelihood this will not be the case as one or 2 will probably need five semesters to finish AS.  With this added assumption I would suggest increasing year 3, 4, 5 annualized FTE to 15 for each year.” Further, he suggested that we “add a row for **cross registered** students in GCCIS.  These should begin in year 3 and be carried out through year 5.  I suggest inputting 5, 10, and 13 annualized FTE for year 3, year 4, and year 5 respectively.”

Enrollment projections for years 1-5, incorporating suggestions from Dr. Miller, are shown in the table below. It includes enrollment of students in the NTID AS program in Applied Networking and the subsequent enrollment as cross-registered (CR) students in Networking and Systems Administration in GCCIS. Projections are listed in “Semesters” of enrollment.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Enrollment** | **Year 1****AY16-17** | **Year 2****AY17-18** | **Year 3****AY18-19** | **Year 4****AY19-20** | **Year 5****AY20-21** |
| AS Enrollments Fall Semester | 8 | 14 | 15 | 15 | 15 |
| AS Enrollments Spring Semester | 8 | 14 | 15 | 15 | 15 |
| Total Semesters of AS Enrollment | 16 | 28 | 30 | 30 | 30 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| CR Enrollments Fall Semester | 0 | 0 | 5 | 10 | 13 |
| CR Enrollments Spring Semester | 0 | 0 | 5 | 10 | 10 |
| Total Semesters of CR Enrollment | 0 | 0 | 10 | 20 | 23 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Total Semesters | 16 | 28 | 40 | 50 | 53 |

## VIII. Impact on Resources

Utilization of Existing Resources

We are anticipating that the number of students interested in transitioning to NSA in GCCIS will be consistent with historic numbers. Additionally, this new AS degree program contains only one new course specific to the degree (NACA-162 Programming Fundamentals in the Network Domain), so the impact on resources will be minimal. Faculty in the ICS department currently have the skills necessary to teach the new course. Lecture and lab space will not be impacted the addition of this one new course since just one section will be sufficient. Software is readily available without an extra cost for use in this course. Computers used for other software instruction will be available.

Since the AS in Applied Networking will allow us to continue a practice we already had in place under the quarter system, (transitioning students to NSA), fewer resources will be needed as compared to the resources needed to customize curriculum plans for students if the AS in Applied Networking is not available.

Cost Model Analysis

The NTID Cost Model analysis, which will be forwarded to the Provost, includes four tables detailing projected expenditures and revenue over the first five years of the program. There are no anticipated capital expenditures. There are no anticipated increases in revenue and no incremental expenditures. This program represents a reallocation of current/existing resources.

Note that NTID’s tuition is applied to support all academic and non-academic programs accessed by students and the program does not fit into the Net Tuition Revenue Model used by other RIT colleges. Tuition is subsidized by federal appropriations and is therefore not cost related. However, the Cost Model details faculty/staff salary and benefits plus costs such as computers, instructional supplies, telephone, software licenses, travel/conferences, and tuition payment for RIT credits (for students in the AS and subsequent BS programs) totaling approximately $560K. The projected revenue includes approximately $499K in tuition.

## IX. Conclusion

In summary, the AS degree in Applied Networking will allow us to continue what we were doing in the quarter system and avoids the need to develop customized academic plans for each student interested in transitioning to NSA under semesters. This program will provide technical education opportunities for students at the associates’ degree level and subsequent employment opportunities available at the baccalaureate level.

## X. Summary of Community Input and Response to Input

The Applied Networking AS degree Concept Paper was posted for public vetting from August 16-30, 2013. During that time one person responded to the call for feedback. The comments were from an NTID faculty member who works with students in baccalaureate programs in Golisano College. He is supportive of the proposal. It will allow “our Deaf students to have more job opportunities” because many employers require a BS degree to manage servers and networks. He stressed the importance of developing students’ writing skills, noting that “clear, well written communication” is essential for Network staff.

This concept Paper was developed and reviewed by the ICS curriculum committee:

David Lawrence, Chair, and committee members comprised of the faculty in the ICS department.