Ferris State University

Nuclear Medicine Technology Program

Academic Program Review 2013

Section 1: Overview of the Nuclear Medicine Technology (NMT) Program

A. Program Goals

1) State the goals of the program.

Mission:

Building upon the mission, vision and values of the College of Health Professions, the Nuclear Medicine Technology program prepares highly qualified and competent professionals for successful and rewarding careers as Nuclear Medicine Technologists.

Goals/Outcomes:

1. Graduates of the Nuclear Medicine Technology Program will communicate effectively as a member of an interdisciplinary health care team.
2. Graduates of the Nuclear Medicine Technology Program will be prepared to become credentialed as Registered and/or Certified Nuclear Medicine Technologists.
3. Graduates of the Nuclear Medicine Technology Program will engage in lifelong learning and promotion of the Nuclear Medicine profession in a legal, ethical and professional manner.

2) Explain how and by whom each of the goals were established.

The goals were established by program faculty using several guidelines. The educational standards established by the program's accrediting body, the Joint Review Committee on Educational Programs in Nuclear Medicine Technology as well as the Curriculum Guide for Educational Programs in Nuclear Medicine Technology from the Society of Nuclear Medicine and Molecular Imaging were utilized. The mission and vision of the College of Health Professions were also used as a guide.

3) How do the goals apply to preparing students for careers in and meeting employer needs in the community/region/marketplace?

The mission and goals of the program prepare students to be entry level nuclear medicine technologists by focusing on the core requirements of the profession. Graduates must be prepared to pass the certification and/or registry exams. Graduates must be able to communicate effectively in the work environment. Graduates must also engage in life-long learning and promotion of the profession to be successful.

4) Have the goals changed since the last program review?

The program goals have been expanded since the last program review to include components from the College of Health Profession's mission. Continued conversations about the program goals occur regularly with the faculty and advisory board members.

5) Describe the relationship of the program goals to the University's mission, and the departmental, college and divisional strategic plans.

The Nuclear Medicine Technology Program's mission and goals fit well into the overall mission of Ferris State University and the College of Health Professions.

The Ferris State University mission is to prepare students for successful careers, responsible citizenship, and lifelong learning. Through its many partnerships and its career-oriented, and broad-based education, Ferris serves our rapidly changing global economy and society.

The College of Health Professions' mission is to prepare students for successful careers in the programs contained therein, to foster responsible citizenship, and to promote lifelong learning. The college will partner with healthcare providers, and facilities to prepare students for rapidly changing careers.

The Nuclear Medicine Technology Program's mission and goals focus on preparing students for successful careers. The goals of the program emphasize the components necessary for students training to be entry-level technologists. The program goals also highlight the university and college's emphasis on lifelong learning.

B. Program Visibility and Distinctiveness

1) Describe any unique features or components of the program.

One unique feature of the Nuclear Medicine Technology Program is that the program is a baccalaureate degree. Most other nuclear medicine technology programs in the country are associate or certificate programs. A Bachelor of Science degree gives our graduates significantly more credit hours of instruction. The program has seen a substantial rise in certification exam scores since the program was changed from an associate degree to a Bachelor of Science degree program. In addition, graduates with a bachelor's degree have an advantage in the workplace in terms of job placement and advancement opportunities.

Another unique feature of the Nuclear Medicine Technology Program is the laboratory facilities and equipment that are available to students on both the Big Rapids and Grand Rapids campuses. Both labs feature modern equipment that is used in all nuclear medicine departments. We are one of the only programs in the country that has functional scintillation scanners. Students receive hands-on experience with all the equipment and scanners before their clinical internship.

2) Describe and assess the program's ability to attract quality students.

The NMT program has been successful in attracting quality students through its entry requirements as well as through recruitment efforts.

In order to apply to the program, high school students must:

- Successfully complete one year of high school chemistry with an average letter grade of "B" or higher.
- Achieve a high school cumulative grade point average of 3.0.
- Earn an ACT math subscore of 19 or higher.

In order to apply to the program, transfer students must:

- Successfully complete one chemistry course with a lab component with a letter grade of "C" or higher.
- Successfully complete MATH 110 with a letter grade of "C" or higher OR have earned an ACT math subscore of 19 or higher.
- Achieve a cumulative grade point average of 2.5 or higher.

Recruitment efforts include the following:

- Career exploration events
- High school and community college class tours
- DAWG Days
- Educator's Academy
- Program inquiries through the university, telephone calls and individual appointments
- Students are recruited via the internet through active websites
- Students are recruited by pre-advising sessions with the pre-advisors for the COHP
- Students are recruited by meeting with the program coordinator and other faculty
- Students are recruited by testimonials from previous program graduates

3) Identify the institutions that are the main competitors for prospective students in this program.

The main competitor for the Nuclear Medicine Technology Program is the only other nuclear medicine technology program in the state of Michigan, Beaumont Hospital School of Nuclear Medicine Technology.

a. How are these programs similar and different from the FSU program?

Similarities:

- Both programs are accredited by the JRCNMT
- Both programs utilize a combination of didactic and clinical education
- Graduates of both programs are able to sit for the national certification exams

Differences:

- Degree earned: FSU graduates earn a bachelor's degree; Beaumont Hospital graduates earn a certificate.
- Program size: Maximum capacity for FSU is 51 students; maximum capacity for Beaumont Hospital is 10 students.
- Internship sites: FSU utilizes 28 hospitals that are located all across the state of Michigan. Beaumont Hospital's students stay at Beaumont.

b. What can be learned from them that would improve the program at Ferris?

Each of the two nuclear medicine technology programs in Michigan is very different from the others. The competitor programs' differences demonstrate the need to continually evaluate the needs of the career as well as the needs of students. The requirements and demands of a nuclear medicine technologist are constantly changing. The Nuclear Medicine Technology Program at Ferris State University has adapted to these changing requirements and must continue to do so in order to be competitive.

C. Program Relevance

1) Provide a labor market demand analysis:

The U.S. Department of Labor Bureau of Labor Statistics estimates that the occupational outlook for Nuclear Medicine Technologists will grow as fast as average compared to all other occupations through 2020 with an estimated employment increase of 4,100 jobs equivalent to a 19% increase.

Job opportunities will most likely be favorable in the coming years. The recent economic downturn combined with changes in diagnostic imaging reimbursement rates have reduced the job vacancy rate in recent years especially in Michigan. Job opportunities vary by geographic location and graduates willing to relocate have better job opportunities. Job availability is expected to increase in the coming years due to new technology and pharmaceuticals, increased utilization of health care and an increase in the technologist retirement rate.

2) Describe and assess how the program responds to emerging issues in the discipline, changes in the labor force, changes in employer needs, change in student needs, and other forces of change.

The Nuclear Medicine Technology Program assesses emerging issues by staying connected with the nuclear medicine community. All of the faculty are members of the Society of Nuclear Medicine and Molecular Imaging and receive regular communication regarding changes in the field. The faculty also regularly participate in educational events regarding emerging issues and changes.

The advisory board meets twice per year and is made up of nuclear medicine technologists and managers. They keep the program abreast of changes in the field. The certification boards also communicate changes to the entry level examinations. The program responds by updating the curriculum, changing clinical requirements and adjusting the number of students admitted to the program each year.

3) Assess why students come to FSU for the program. Summarize the results of the graduate exit survey and student program evaluation.

- Only university based program in the state of Michigan
- Only bachelor degree program in the state of Michigan
- Excellent preparation for certification exams

- Variety of internship opportunities
- Laboratory facilities and equipment
- Small lab size

a. How does the program meet student expectations?

The program is meeting expectations based on the survey results.

b. How is student sentiment measured?

We measure student sentiment in the current student and graduating student surveys.

D. Program Value

1) Describe the benefit of the program, facilities, and personnel to the University.

The NMT program benefits Ferris State University by its uniqueness. It is the only nuclear medicine technology program in Michigan outside of the greater Detroit area. It is also the only bachelor degree program in Michigan. The Nuclear Medicine Technology Program is one of the only programs in the country to have a functional scintillation camera in each of the labs. The program assists the university in meeting the workforce needs of the health care industry in the state. The quality of the program enhances the reputation of the university.

The Nuclear Medicine Technology Completion Degree program increases the visibility of the university in Michigan and nationally. Graduates from Ferris State University or any nuclear medicine technology program who have earned an AAS degree can enroll in the fully online completion degree and earn their bachelors in nuclear medicine technology.

2) Describe the benefit of the program facilities, and personnel to the students enrolled in the program.

The laboratory experience is extremely beneficial to the students in the program. Students receive hands-on experience even before they begin internship. The last two semesters of the program consist of a 40 hour per week internship in a nuclear medicine department. This extensive clinical experience allows students to graduate as prepared entry level nuclear medicine technologists. Pass rates from the national certification exams have been higher than the national average which indicates that graduates are well prepared for the career requirements after completing the program.

3) What is the assessment of program personnel of the value of the program to employers?

Employers have indicated that they are satisfied with Ferris State University NMT graduates. They have expressed increased satisfaction with graduates since the program changed from an associate's degree program to a bachelor's degree program in 2008.

4) **Describe the benefit of the program, faculty, staff and facilities to entities external to the University.**

Faculty members have presented at the Lilly North Conference, MiBuG Blackboard Conference, and Conference for Teaching, Learning, and Civic Engagement. Faculty have also reviewed articles and textbooks. Program faculty are active in their professional organizations and have served as consultants with local hospitals and health care organizations.

5) **What services for extra-University general public groups have faculty, staff or students provided.**

Faculty and students have provided services to groups outside the university. Demonstrations and lab tours are done frequently to educate the public about nuclear medicine technology. The Ferris Nuclear Medicine Association works closely with various non-profit groups to raise money and awareness for multiple causes.

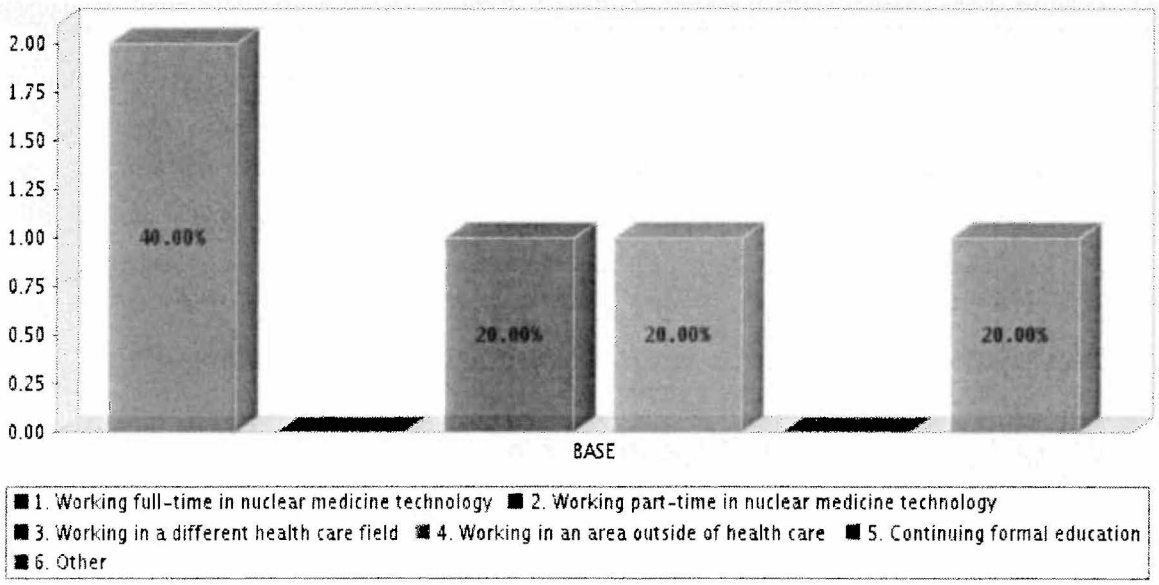
Section 2: Collection of Perceptions

A. Graduate Survey

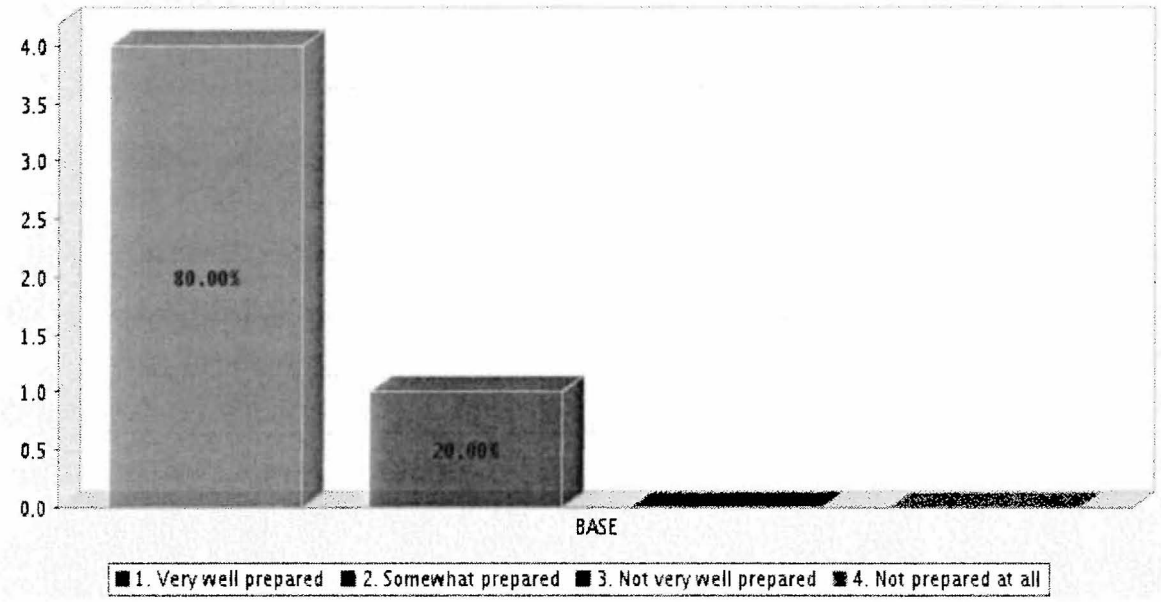
The graduate survey was written by program faculty and emailed to students who graduated from the program from 2011-2012 using QuestionPro as the on-line survey tool. There were 5 respondents. The low number of respondents is most likely due to the fact that the program has a difficult time maintaining updated contact information for students after they graduate.

Results:

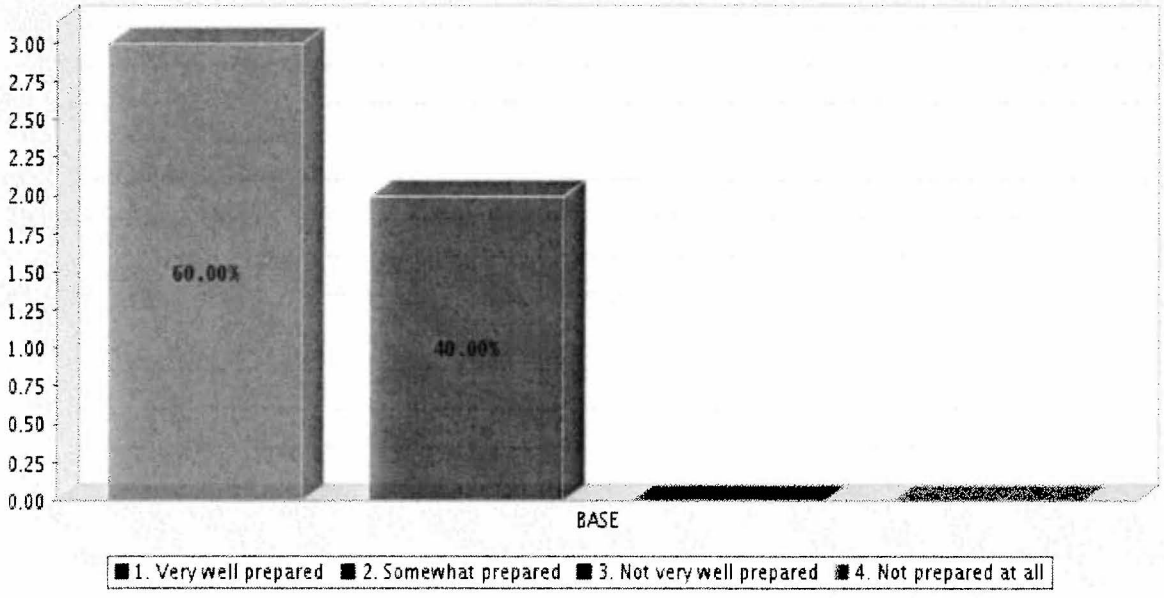
1. Please describe your current employment situation.



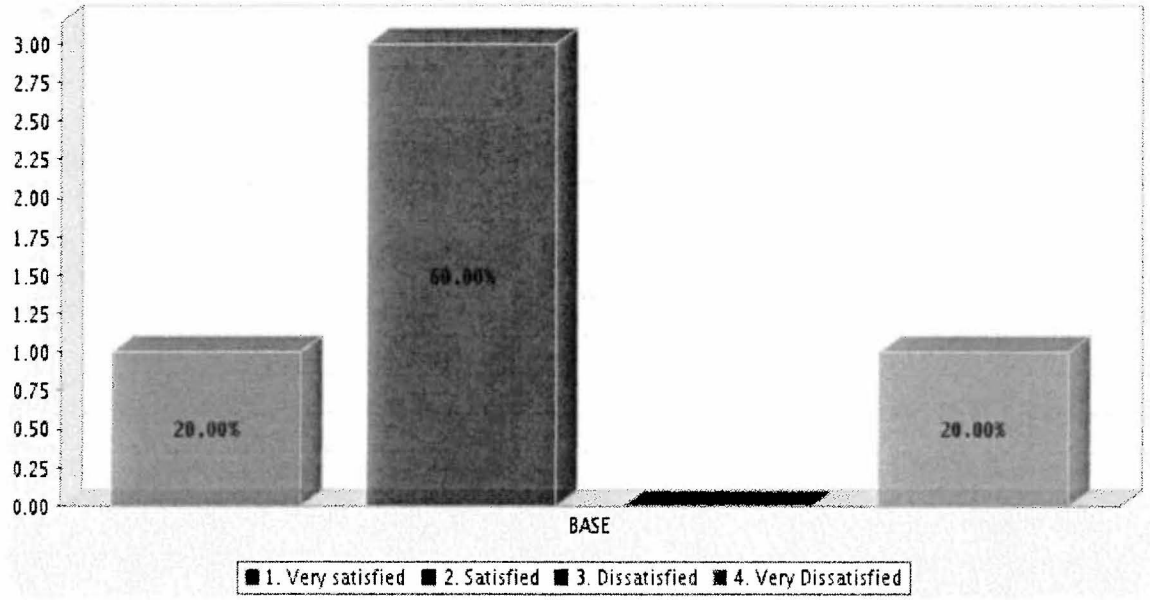
2. How well do you feel the program prepared you for the certification exam(s)?



3. How well do you feel the program prepared you for the requirements of being a nuclear medicine technologist?



4. What is your overall satisfaction with the Nuclear Medicine Technology Program?



5. Please describe your current employment situation.

Working PRN in nuclear medicine technology

Suggestions to help improve the program:

Discontinue the program or make it smaller. There are not jobs available for new graduates. 2011 grads and 2012 grads are struggling to find jobs, even out of state. Even experienced techs are having trouble finding work other than PRN.

Additional Comments:

I graduated top of my class, finished my check-offs months before anybody else, and I had the highest recommendations available... Yet I was completely unable to get any kind of job in Nuc Med. The field is so boxed in and closed down that students should be told the truth from the beginning.

Discussion:

Although the response rate is very low, the results show that graduates are satisfied with the program. 80% of respondents said that they felt very well prepared for the certification exams and 80% of respondents said they were either satisfied or very satisfied overall with the program. Student comments indicate frustration with the current job market.

B. Employer Survey

The employer survey was written by program faculty and emailed to many of the nuclear medicine administrators in the state of Michigan using QuestionPro as the on-line survey tool. There were no respondents. The lack of response is most likely due to the fact that the administrators are very busy and the fact that many nuclear medicine administrators are also advisory committee members for our program and had recently been asked to fill out an advisory committee survey. Many of the questions asked in the employer survey are similar to questions asked in the advisory committee survey.

C. Graduating Student Exit Survey

The graduating student exit survey was written by program faculty and administered in written form to the graduating class of 2013. There were 41 respondents.

Results:

	Very Satisfied	Satisfied	Dissatisfied	Very Dissatisfied
Relevance of courses	15 (36%)	24 (58%)	2 (5%)	
Laboratory facilities and equipment	17 (41%)	18 (44%)	6 (15%)	
Quality of lecture instruction	20 (51%)	18 (46%)	1 (2%)	
Quality of lab instruction	20 (50%)	18 (45%)	2 (5%)	
Instructor knowledge	23 (58%)	15 (38%)	2 (5%)	
Instructor availability and communication	11 (28%)	15 (38%)	12 (30%)	2 (5%)
Advising assistance	17 (42%)	18 (45%)	4 (10%)	1 (2%)
Satisfaction of program outcomes	15 (38%)	19 (48%)	5 (12%)	1 (2%)
Internship experience	25 (62%)	13 (32%)	1 (2%)	1 (2%)
Overall satisfaction with program	15 (39%)	19 (50%)	3 (8%)	1 (3%)

Suggestions to help improve the program:

- Better communication (12)
- Update equipment /materials used to teach (6)
- Inform students of job market (5)
- Do not accept as many students (4)

- More organization with assignments and due dates (3)
- One on one interviews while students are on site visits (2)
- Help students find jobs (2)
- More clinical labs (2)
- Practice exams for boards
- Review curriculum
- PET course in class instead of online
- Focus lab on positioning and acquiring images
- Better advising
- More fast paced
- Remove this program
- Eliminate the capstone course
- More comfortable with the sites
- More lab time

Additional Comments:

- Teachers were excellent (6)
- Warn students of the job market (3)
- Great program with great preparation (2)
- Better communication (2)
- More personal interaction with professors (2)
- Some teachers were unorganized with due dates/assignments
- Would not recommend this program to anyone
- Limit the amount of incoming students
- Some professors seemed to play favorites, which also reflected in the grades
- Be able to provide information on other degrees (i.e. Masters)
- Less online classes

Discussion:

Overall, the graduating students are very satisfied with the various components of the program. 97% of graduating students were either satisfied or very satisfied with the quality of lecture instruction and 95% of graduating students reported that they were either satisfied or very satisfied with lab instruction. In addition, 94% of graduating students reported that they were either satisfied or very satisfied with their internship experience. Overall satisfaction with the program was rated high as well. 89% of students said that they were either satisfied or very satisfied with the program overall.

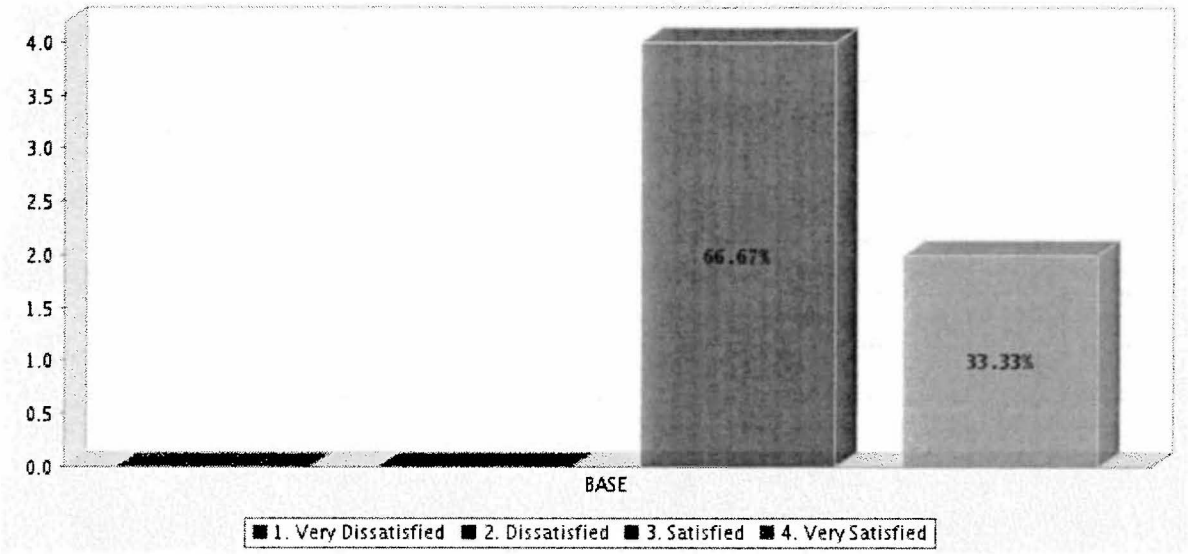
One area of concern from the survey results is instructor communication. 35% of graduating students said that they were either dissatisfied or very dissatisfied with instructor availability and communication. It was also mentioned 12 times as an area that needs improvement in the program. Methods to address and improve this area will be discussed at future program meetings.

D. Current Student Survey

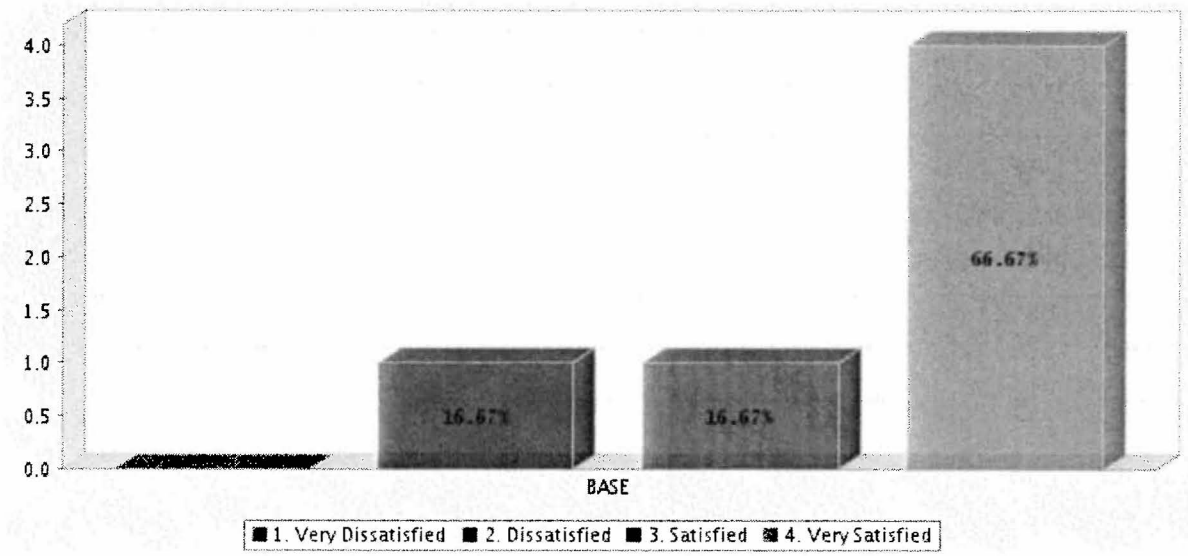
The graduate survey was written by program faculty and emailed to all current second-year students using QuestionPro as the on-line survey tool. There were 6 respondents.

Results:

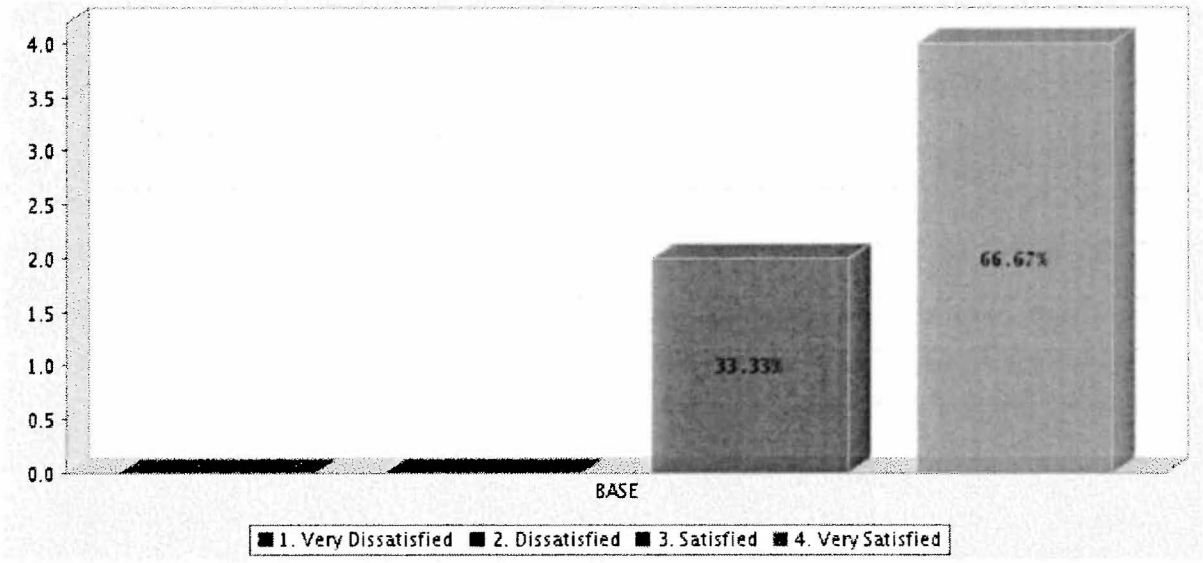
1. Realistic prerequisites



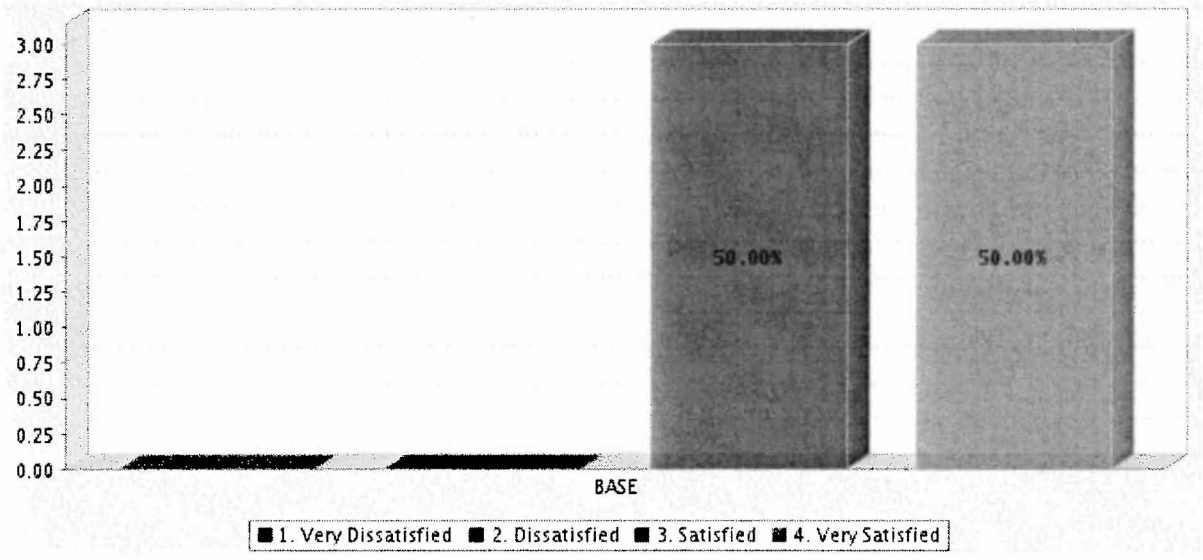
2. Relevance of courses



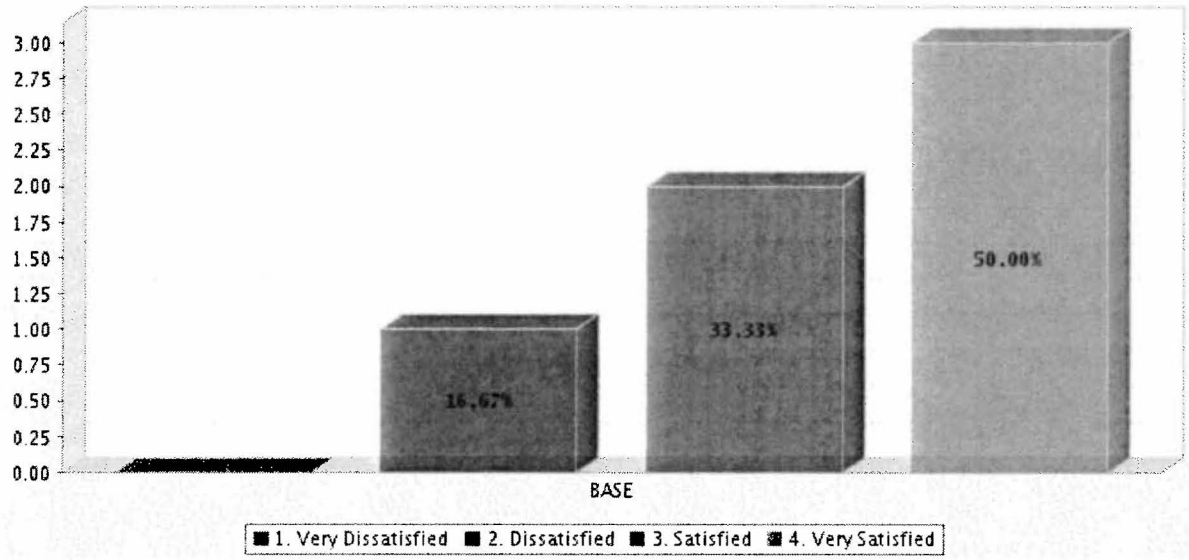
3. Quality of lecture instruction



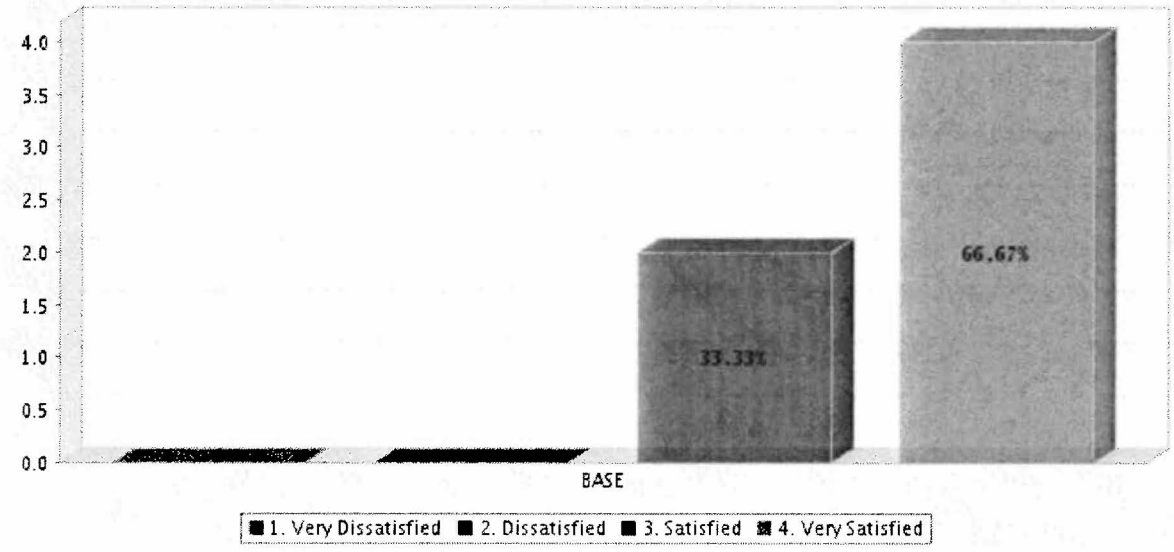
4. Quality of lab instruction



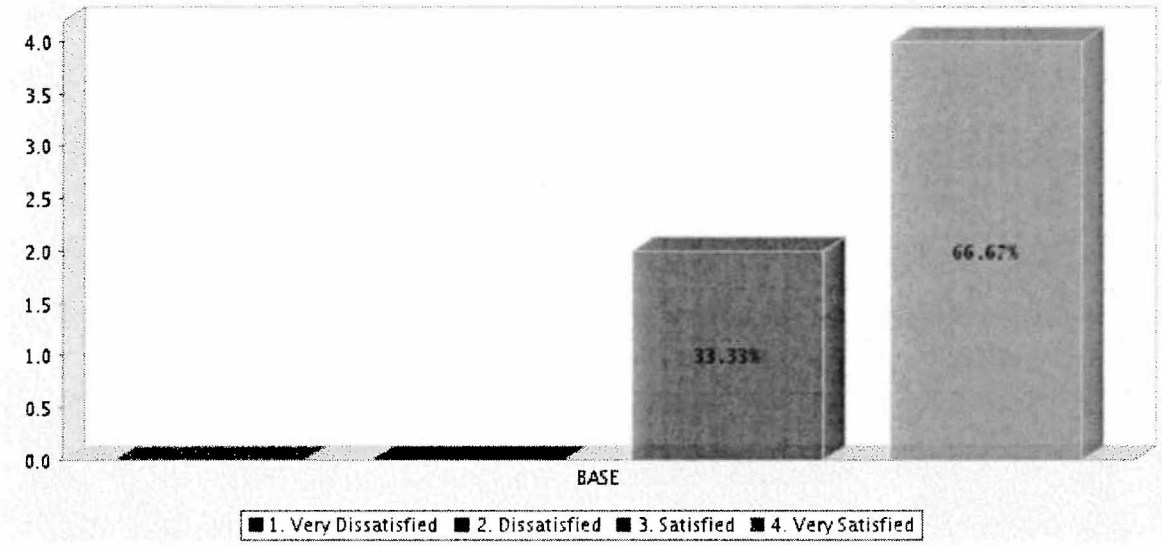
5. Laboratory facilities and equipment



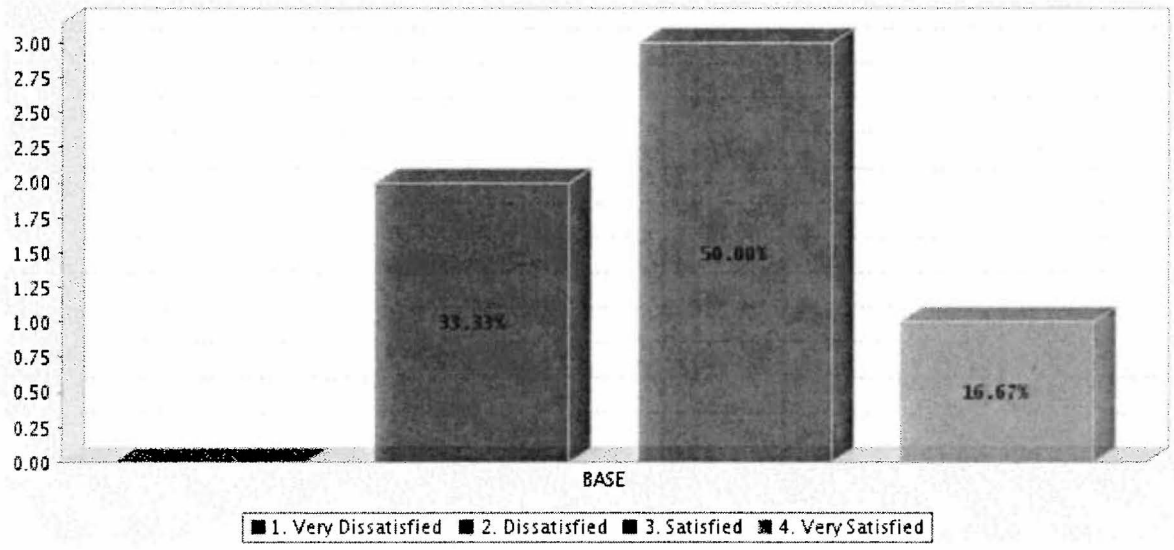
6. Instructor knowledge



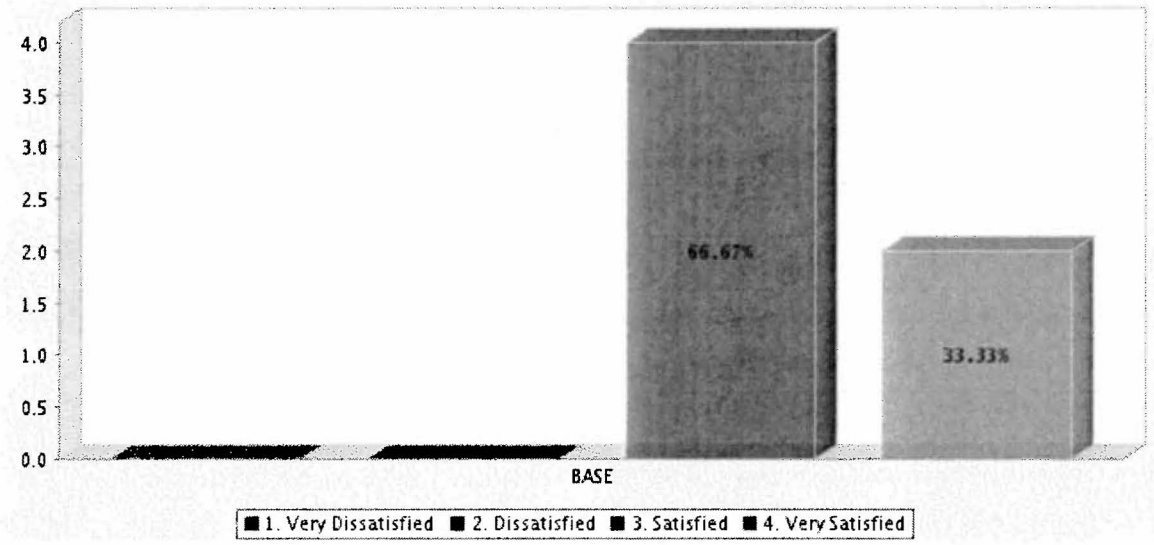
7. Instructor availability and communication



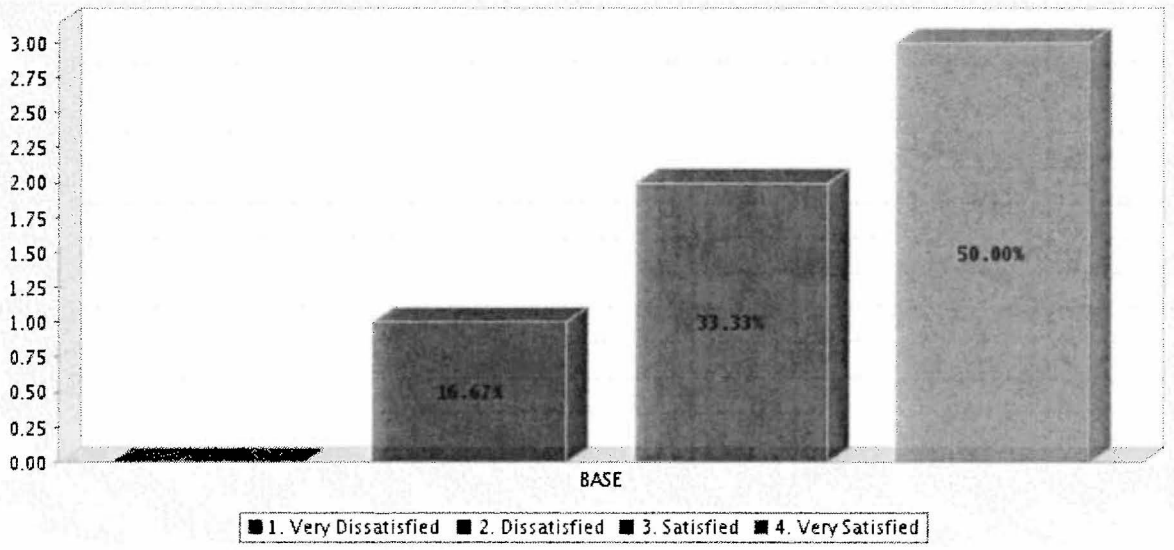
8. Advising assistance



9. Satisfaction of program outcomes



10. Overall satisfaction with the program



Suggestions to help improve the program

I think the internship selection process could be improved. I am personally satisfied in where I am going. But if you don't get your first choice a person most likely won't get their 2nd, 3rd, or 4th choice. I understand people are going to be dissatisfied but it seems like we could improve satisfaction in selecting interns.
More internship locations
We need a new lab. It's a horrible set up.
Smaller lab class size when there is not adequate facilities to accommodate for all of the students. Less time sitting around not performing tasks in lab due to this problem. Also less one on one instructor time to fully

answer questions. More homework assignments to help learn the course material through ways other than reading lecture notes.
We need to do more hands on things, even in lecture. It seems like we forget things immediately, because we can't relate them to anything.

Additional Comments:

I have never had professors as kind and as helpful as ____ and ____ when you have questions
I love NM so far!
When I applied for the program I was told that the Grand Rapids Ferris State University students had priority to the Grand Rapids intern sites and I think we should not have been told that since that was not the case.

Discussion:

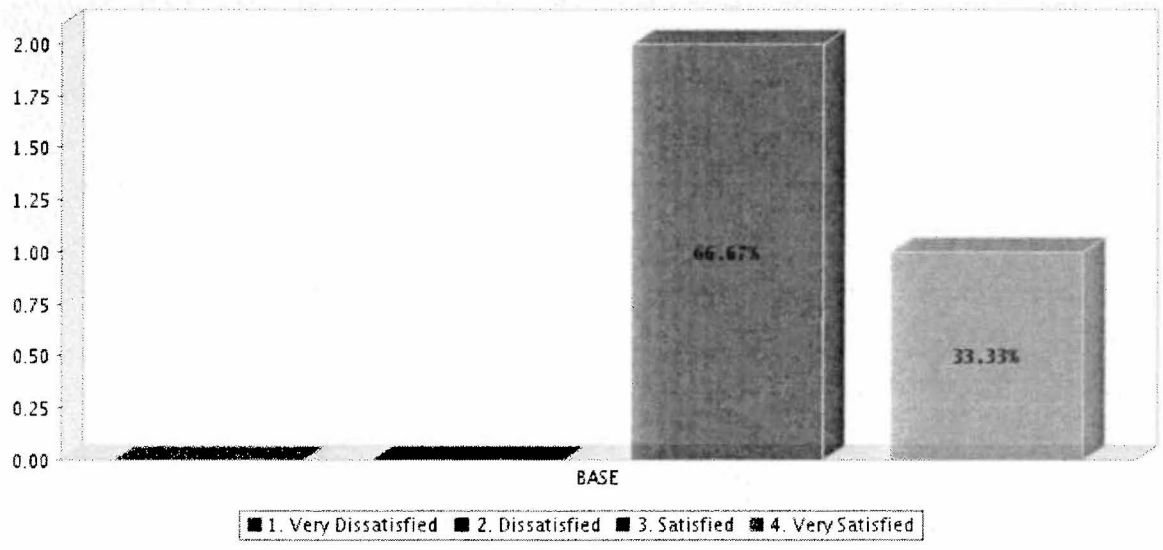
Although the response rate for the survey was fairly low, the survey results indicate that most current students are satisfied with the program. 83% of respondents indicated they were either satisfied or very satisfied overall with the program. 100% of the respondents reported that they were either satisfied or very satisfied with both the lecture and laboratory instruction. Student comments indicate some frustration with the internship selection process which is not surprising due to the difficult task of determining where each student should be place for their internship year.

E. Faculty Perceptions Survey

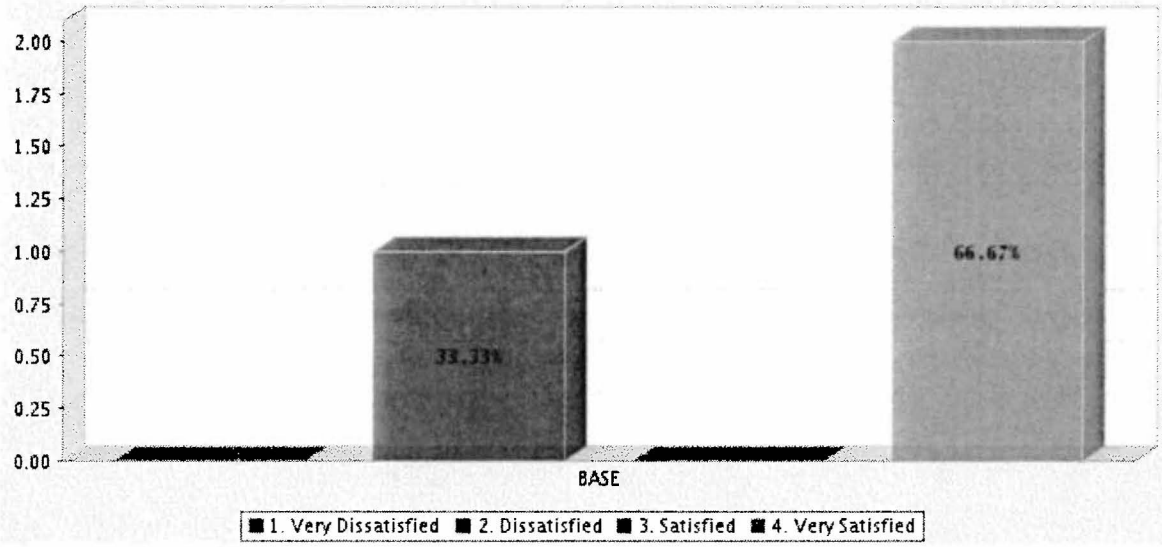
The graduate survey was written by program faculty and emailed to all faculty members using QuestionPro as the on-line survey tool. All three faculty members responded.

Results:

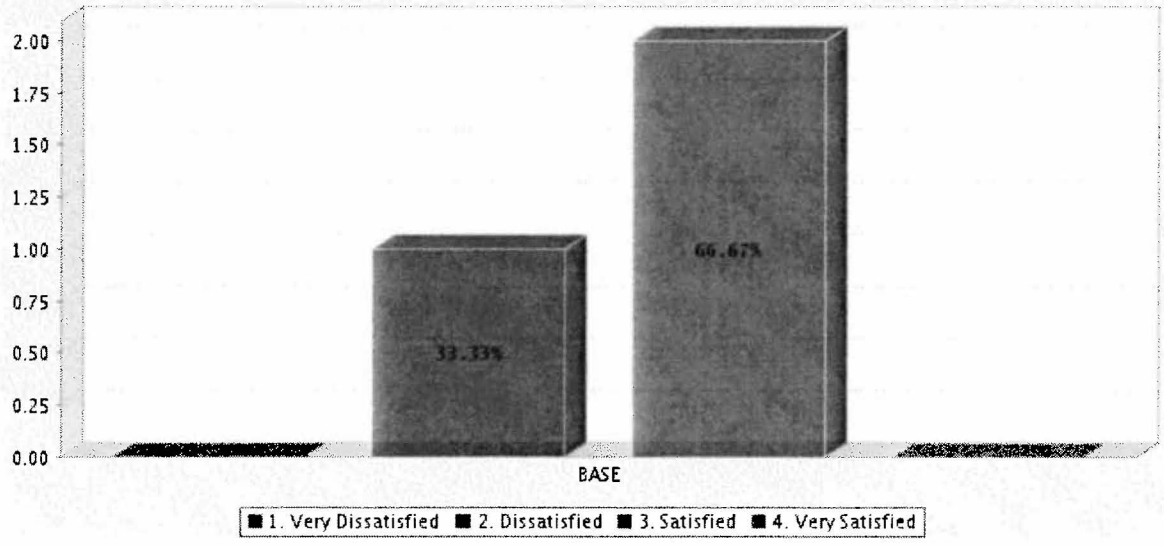
1. Program admissions standards



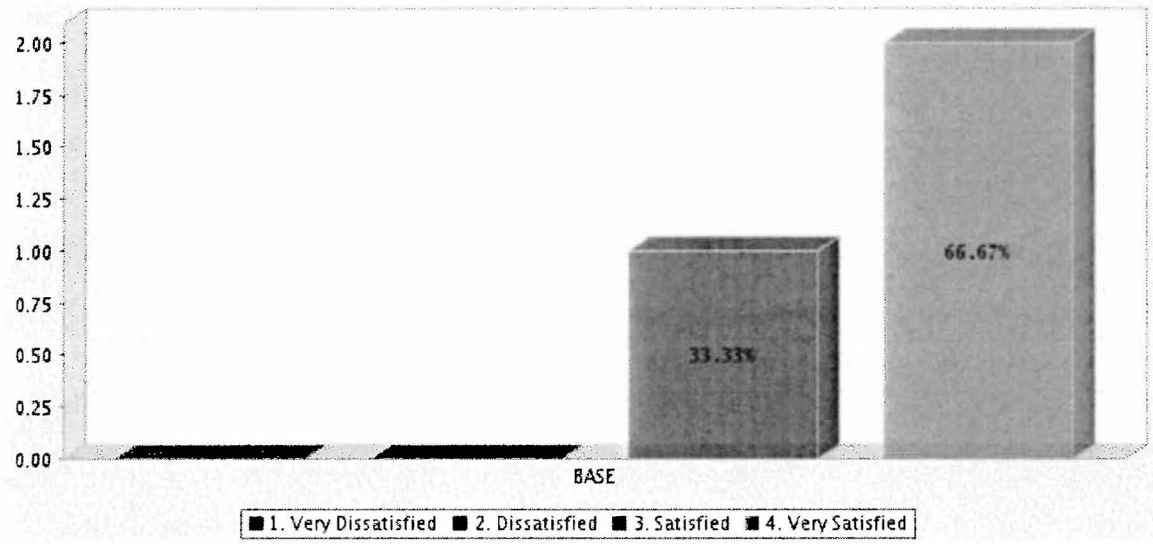
2. Quality and relevance of the curriculum



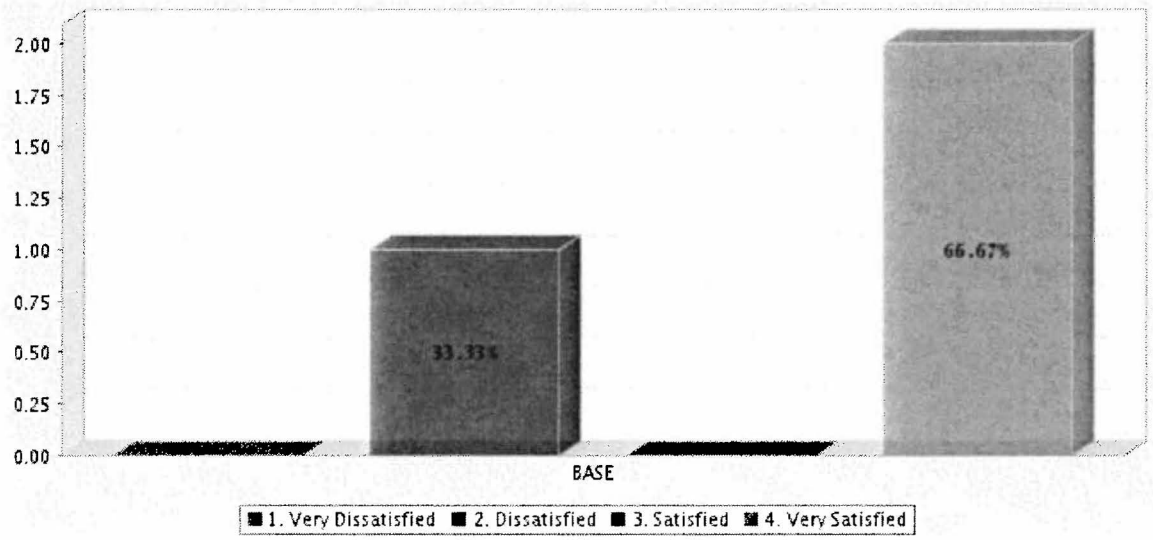
3. Laboratory facilities and equipment quality



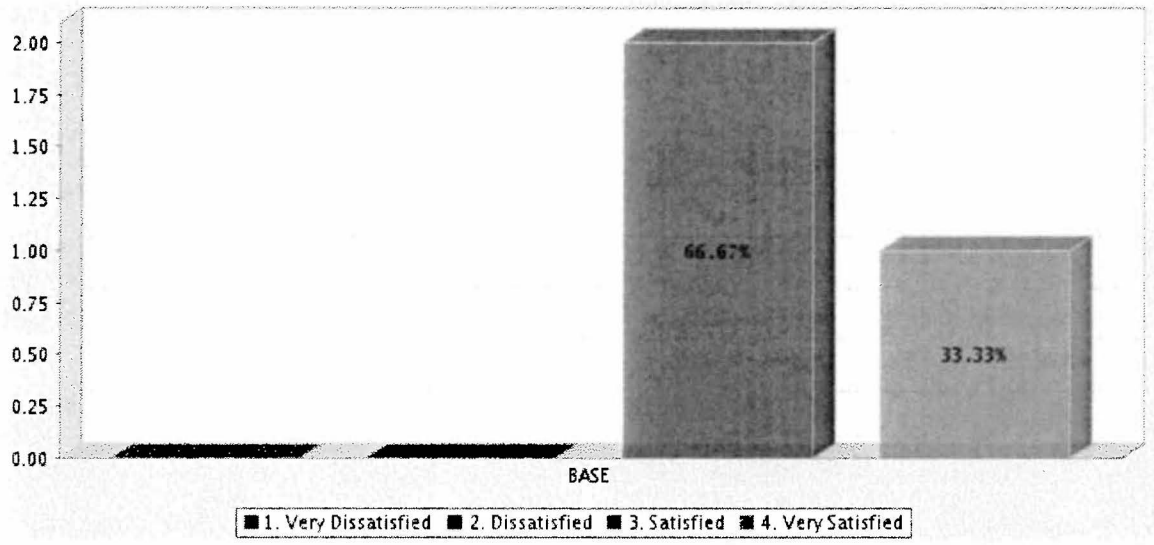
4. Resources available to faculty



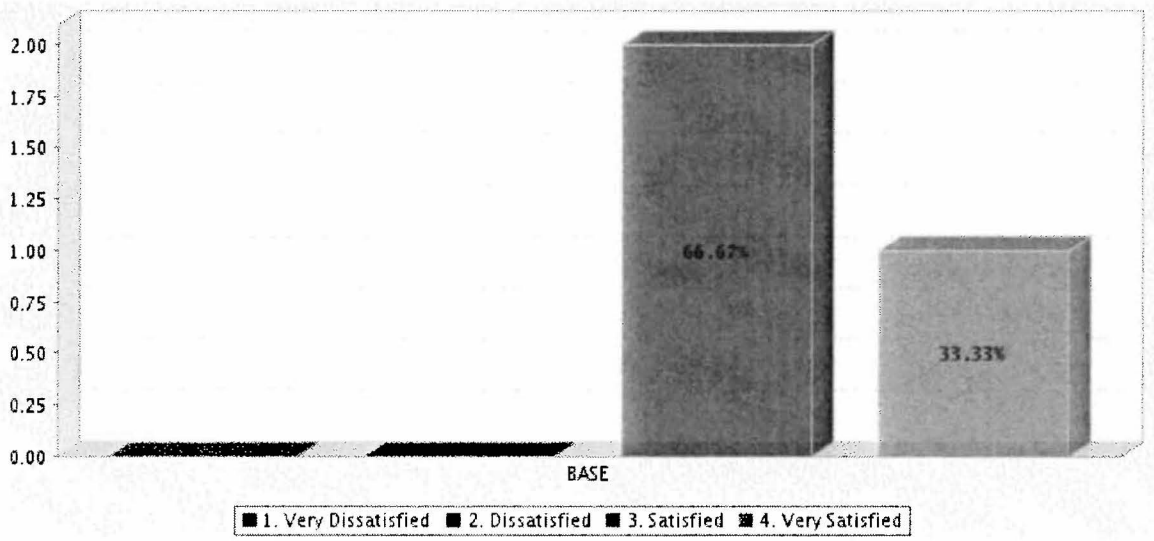
5. Opportunities for professional development



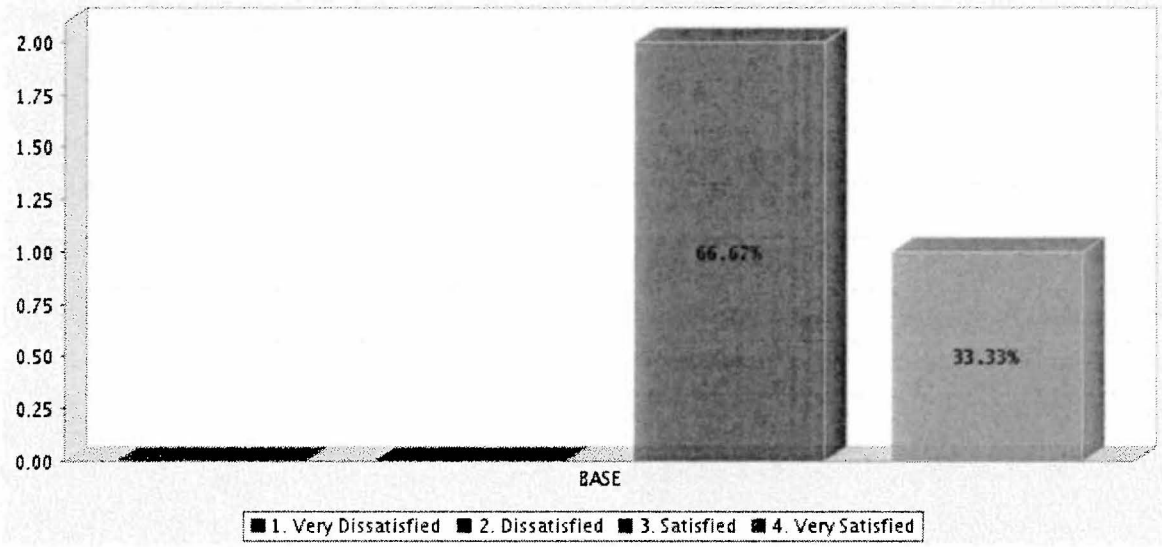
6. Support from administration



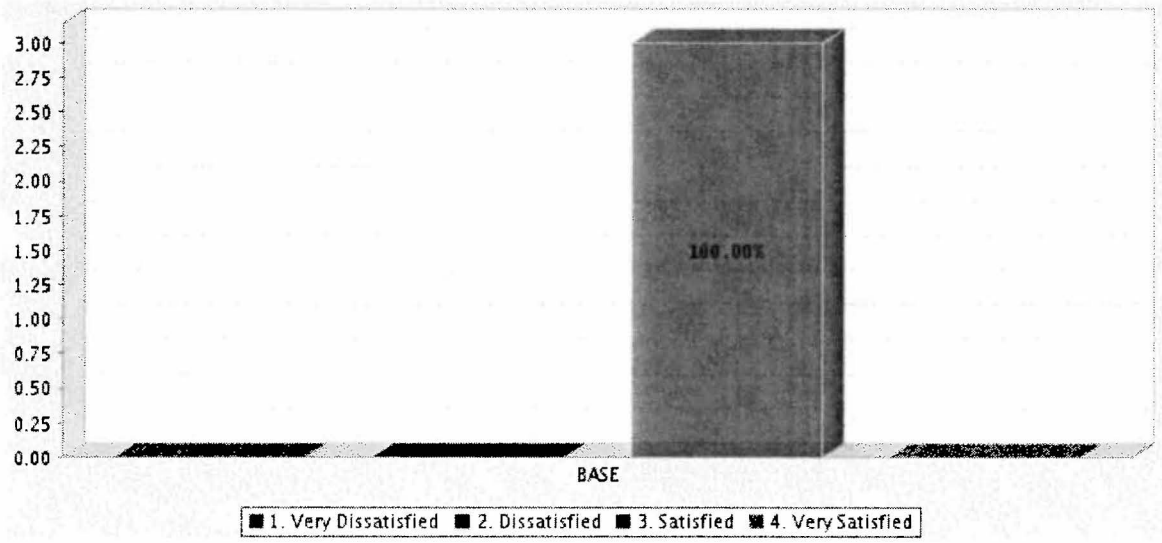
7. Faculty participation in program development and improvement



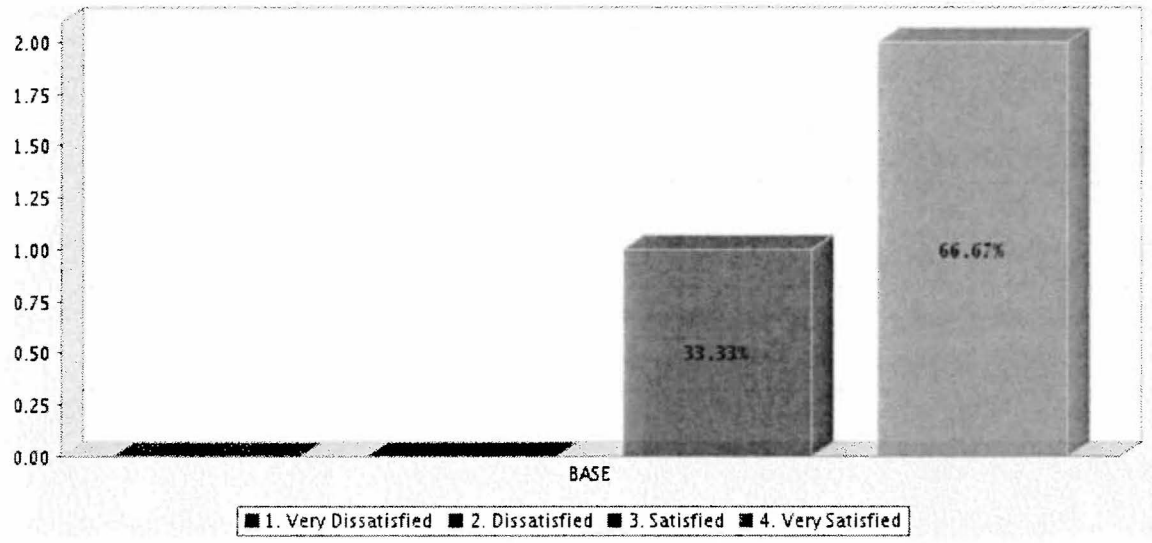
8. Use of advisory committee



9. Student recruitment efforts



10. Overall quality of the program



Additional Comments:

Lab is in need of updating. Floor, ceiling, etc. are not appealing. Hard to recruit with current look. The lab does not match the rest of the college's labs. It would be "morale improving" if the Department Head sought input regarding scheduling courses each semester from the faculty. On a positive note, professional development activities from FCTL are wonderful. Equipment / instruments utilized in lab are state-of-the-industry.
The curriculum and program design is very strong. Professional development opportunities and resources are very good. Lab equipment is great. Big Rapids lab needs renovation.

Discussion:

The survey results indicate that the faculty are generally very satisfied with the program. All three faculty members stated that they were either satisfied or very satisfied with the overall quality of the program. The faculty members were pleased with the support from the administration as well as the amount of resources available to them. One area of concern that was highlighted on the survey is the need for the Big Rapids lab to be updated.

F. Advisory Committee Survey

The graduating student exit survey was written by program faculty and administered in written form to the advisory committee members during an advisory committee meeting. There were 20 respondents.

Results:

	Excellent	Good	Acceptable	Below Expectations	Poor
The current curriculum meets the need of our graduating students.	6	12	2		
The program provides students with the necessary skills for entering the job market.	5	10	5		
The program meets the current trends in nuclear medicine.	2	13	5		
Program is continually reviewed and improved to keep up with changes in the field.	9	7	4		
Students have a strong understanding of nuclear medicine concepts upon graduating.	9	8	3		
Equipment used in labs is representative of equipment being used in the clinical environment.	3	7	9	1	
Students and sites display enthusiasm for the program.	9	9	2		
The advisory committee is utilized appropriately for input on program environment.	8	10	2		
The faculty is meeting the needs of the students.	8	7	5		

1. What do you feel are the future trends in Nuclear Medicine in the next 10 years?
   - PET-CT (7)
   - SPECT-CT (4)
   - Less NM, toward advanced imaging technologists (4)
   - Increase in job market (4)
   - Hybrid Imaging (3)
   - Fusion Imaging (2)
   - Multiple registry
   - General NM
   - Clinical Trial therapies
   - Patient satisfaction incorporation with business practices
   - More therapies

2. What are the programs strengths?
   - Great staff (3)
   - Excellent curriculum –B.S. track (3)
   - Diversity of internship sites (2)
   - Understanding of individual needs (2)
   - Strong on-campus teaching (2)
   - Knowledge of essential concepts (2)
   - Choose students that want to learn (2)
   - Math, sciences and computer sciences
   - Clinical lab
   - Core competency on clinical background
   - Downsizing to fulfill employment needs

3. What areas does the program need to improve upon?
   - Decrease number of students per class annually (3)
   - More required needs for mastery check-offs (2)
   - Hands off college experience to match hospital work (2)
   - PET, PET/CT, SPECT/CT (2)
   - Preparing students for clinical sites (2)
   - More time for check offs
   - Focus on new trends and procedures
   - Retention, Discipline Communication with students
   - Cross training
   - More professionalism from students
   - Informing students on the future of the field
   - Theory
   - Marketing
   - Review of basics prior to internship

4. What important issues do you feel the program needs to address immediately?
   - Limited job placement (6)
   - Updating/focusing on PET-CT and SPECT-CT (2)
   - Retention (2)
   - Demerits
   - Change to check off sheet to represent critical thinking skills and application of knowledge beyond the basics
   - Strict discipline policy
   - Concepts
   - Interpersonal coping skills
   - Slow marketing for the program

Discussion:

The survey results indicate that most of the advisory committee members are satisfied with the program. The vast majority of respondents rated all the program criteria as either excellent or good. It appears that the committee is satisfied with the faculty and the curriculum. They are also satisfied

with the way the advisory committee is utilized for feedback and program improvement. Some areas of concern that were mentioned were the laboratory facilities and accepting too many students into the program each year.

Section 3: Program Profile

A. Profile of Students

1) Student Demographic Profile

a. Gender, race/ethnicity, age

Term	Enrolled	Male	Female	Black	White	Hispanic	Native	Asian	Hawaiian	Multi
Fall 2008	62	19	43	1	61	0	0	0	0	0
Fall 2009	112	48	64	1	108	0	1	1	0	0
Fall 2010	150	70	80	4	140	0	1	2	0	0
Fall 2011	148	65	83	4	135	3	0	3	0	0
Fall 2012	123	60	63	4	106	3	0	2	0	3

b. In State, out of State

Term	In state	Out of state
Fall 2008	62	0
Fall 2009	112	0
Fall 2010	149	1
Fall 2011	146	2
Fall 2012	118	4

c. Full Time and Part Time

Term	Full Time	Part time
Fall 2008	28	34
Fall 2009	44	68
Fall 2010	85	65
Fall 2011	86	62
Fall 2012	73	50

d. Attend classes during the day, weekend, and evenings

All FSU NUCM courses are currently offered during the day Monday through Friday with the exception of fully on-line courses. Internship is offered during the day only with no evenings or weekends. Students may elect to enroll in general education, core curriculum, and non-professional courses during the evenings or weekends.

e. Enrolled in classes on and off campus

Students enrolled in the program take all their professional courses together either at the Big Rapids or Grand Rapids campuses of Ferris State University. Each student is assigned to a cohort and may not travel between the two campuses for their professional courses. Non-professional courses, including core curriculum, may be taken on-line, in person or at an off campus location. The Grand Rapids cohort may also enroll in courses at Grand Rapids Community College. Internship during the last year is off campus at an affiliate clinical site with the coursework performed via FerrisConnect.

f. Enrolled in 100% on-line and mixed delivery courses:

During the first six semesters the program, all NUCM classes are offered face to face with the exception of 4 courses which are offered as either mixed delivery or fully on-line depending on the semester. During the final two semesters of the program students take two online courses concurrent with their internship.

g. Discuss how the information presented in (a) through (f) impacts the curriculum, scheduling, and/or delivery methods in the program.

Most nuclear medicine course are offered face to face mostly due to the fact that a significant number of courses are laboratory based. A small number of courses are offered either mixed delivery or fully on-line because the material is conducive to these formats. Courses taken during internship are fully on-line because students are placed at clinical sites all across the state. All NUCM courses are supplemented through FerrisConnect allowing students to access syllabi, lecture materials, grade book, program policies, practice materials, etc. from home.

2) Quality of Students

a. What is the range and average GPA of all students currently enrolled in the program? ACT?

Term	Avg. GPA	Min. GPA	Max. GPA	Avg. ACT	Min. ACT	Max. ACT
Fall 2008	3.34	2.2	3.95	22.54	15	29
Fall 2009	3.40	1.78	4	22.74	15	30
Fall 2010	3.37	2.06	4	22.65	15	30
Fall 2011	3.29	1.8	4	22.46	16	30
Fall 2012	3.23	2.01	4	22.22	16	28

Recently the College of Health Professions increased the admissions requirements which should improve the average. The program has some attrition each year. Based on the data above, the program is attracting on average high quality students.

b. What are the range and average GPA's of students graduating from the program? ACT?

Year	Avg. GPA	Min. GPA	Max. GPA	Avg. ACT	Min. ACT	Max. ACT
2009-2010	3.54	2.67	3.79	21.81	17	26
2010-2011	3.60	3.05	3.99	22.26	15	27
2011-2012	3.54	2.86	3.97	23.29	18	30

Based on the data above, the program maintains a qualified student throughout the professional sequence through graduation from the program.

c. In addition to ACT and GPA, identify measures that are used to assess the quality of students entering the program.

In addition to the cumulative GPA requirements of 2.5 for college students and 3.0 for high school students, students must meet the following in order to apply to the program:

- Successfully complete a chemistry course with a lab component with a letter grade of "C" or better (for high school applicants, successfully complete one year of chemistry with an average letter grade of "B").
- Successfully complete MATH 110 with a letter grade of "C" or higher OR have earned an ACT math subscore of 19 or higher.

d. Identify academic awards students in the program have earned.

Each year students have an opportunity to apply for two major scholarships offered through The Society of Nuclear Medicine and Molecular Imaging. The first, The Paul Cole Scholarship, is based on financial need and awards $1000 to approximately 12 students per year. The second, The Mickey Williams Scholarship, awards $5000 to a minority student. Ferris State students have frequently been awarded these scholarships.

e. What scholarly/creative activities have students participated in?

Ferris State University NMT students are invited to participate in Central Chapter Society of Nuclear Medicine and Molecular Imaging activities such as the annual spring meeting and continuing education "road shows". A significant number of students each year choose to participate. Students have also participated in educational lectures at Spectrum Health and other health care providers.

f. What are other accomplishments of students in the program?

The NMT program has many students in the Honor's Program and on the Dean's List. Students have the opportunity to join the Ferris Nuclear Medicine Association. This RSO is social as well as service oriented. Each year the members decide on a charity of choice and provide assistance to this charity in various ways.

3) **Employability**

a. **How many graduates have become employed full-time in the field within one year of receiving their degree?**

According to the graduate survey, 40% of 2011 and 2012 graduates were employed full-time within one year of graduation. This number is likely inaccurate due to the low number of responses to the survey. We have started collecting graduate's personal email addresses prior to graduation so that we can hopefully increase the response rate for the graduate survey in the future and more accurately track job placement rates. The recent economic recession as well as significant changes in reimbursement for some nuclear medicine tests has led to a recent job shortage, especially in Michigan. Graduates who want to stay in Michigan have experienced a more difficult time finding a full-time job. Job placement rates will certainly improve in the future as the economy improves and many promising new tests for cancer and neurological diseases are approved.

b. **What is the average starting salary of graduates who become employed full time? Compare to state and nationwide trends.**

We do not currently track starting salaries for our graduates. The median annual salary for nuclear medicine technologists is $68,560 according the Bureau of Labor Statistics.

c. **How many graduates have become employed as part time or temporary workers in the field after one year of receiving their degree?**

The graduate survey did not receive a high enough response rate to accurate measure how many graduates were hired as part time or temporary. Through word of mouth we know that many of our graduates are finding jobs after graduation, though many are being hired part-time. In many cases we have seen that a part time position will lead into a full time position for many of our graduates.

d. **Describe the career assistance available to students. What is the student perception of career assistance?**

Career assistance is provided by the university and the NMT program. Faculty members have industry connections that keep them aware of job openings. Many of the graduates are hired at their clinical affiliates before their internship ends. Ferris students attend university sponsored career fairs and use the employment office for resources such as interviewing techniques and resume writing.

e. **How many graduates continue to be employed in the field?**

The program has not been able to accurately measure this.

f. **Describe and comment on the geographic distribution of employed graduates.**

Although the majority of students are employed in Michigan, the NMT program has recent graduates in other states including Wisconsin, Indiana, Louisiana and Montana.

g. How many students and/ or graduates go on for additional educational training?

Approximately 15% of all NMT graduates continue on for additional education.

h. Where do most students and / or graduates obtain their additional educational training?

Some NMT graduates stay at Ferris State University to pursue a Health Care Systems Administration bachelor's degree. Other students go on to medical school or enroll in physician assistant or physical therapy programs at Michigan State University, Wayne State University, or University of Michigan.

B. Enrollment

1) What is the anticipated fall enrollment for her program?

The anticipated fall 2013 enrollment is 38 first year students, 35 second year students, and 34 third year interns.

2) Have enrollment and student credit hour production (SCH) increased or decreased since the last program review?

Enrollment has remained relatively stable since the last program review. We have the capacity to enroll more students, but due to the current job market we do not feel it is advisable at this time. Student credit hour production has increased since the last program review as demonstrated below.

Student Credit Hours (F + Sp)

2007-2008	1,357
2008-2009	1,560
2008-2009	1,412
2010-2011	1,605
2011-2012	1,679

3) Since the last program review, how many students applied to the program annually?

Typically between 40 and 50 students apply for the NMT program each year. There were 44 applications received in 2012 and 42 applications received in 2013.

4) Of those who apply, how many and what percentage are admitted?

The NMT program typically accepts between 35 and 40 students per year. This number is based on the number of internship sites as well as the current job market. Approximately 90% of those who apply are accepted.

5) **Of those who are admitted, how many and what percentage enroll.**

Typically about 95% of accepted students enroll in the program.

6) **What are the program's current enrollment goals, strategy, and efforts to maintain/increase/decrease the number of students in the program?**

Program faculty will continue to monitor the job market and adjust enrollment levels based on job availability. The program has the ability to increase enrollment, but due to the reasons discussed earlier, it is not advisable at the current time. There are many reasons why the job market will significantly improve in the future and the program will increase enrollment when it is advisable to do so.

C. Program Capacity

1) **What is the appropriate program enrollment capacity, given the available facility, physical resources, funding accreditation requirements, state and federal regulations, and other factors?**

Maximum enrollment in the professional sequence of the NMT program is 51 students. This is determined by accreditation standards and is based on the maximum allowable number of students at our clinical affiliates.

D. Retention and Graduation

1) **Give the annual attrition rate in the program.**

Graduating class of 2009 (AAS)	37/40	8%
Graduating class of 2010 (AAS)	25/32	22%
Graduating class of 2011 (BS)	31/42	26%
Graduating class of 2012 (BS)	40/53	24%

The program has seen a rise in the attrition rate since making the change from the associate's degree to the bachelor's degree. The program is offered in an accelerated three-year format and is academically rigorous which contributes to the current attrition rate. Yet, since the program changed to a bachelor's degree, pass rates on the national certification exams have increased significantly.

2) **What are the program's current goals, strategies, and efforts to retain students in the program?**

Attrition occurs for a variety of reasons. Nuclear medicine technology is a very unique area of health care. Some students do not research the demands and requirements of the field before they apply for the program. Faculty encourage perspective students to research the career and take advantage of job shadowing opportunities before they begin the program. Some students find the program to be too academically challenging. Program faculty offer assistance whenever possible to help students who are struggling academically.

3) **Describe and assess trends in number of degrees awarded in the program.**

The number of degrees awarded has been stable. Students who begin the program will earn a degree unless they are dropped from the program due to poor academic performance or personal reasons.

4) **How many students who enroll in the program graduate from it within the prescribed time?**

The program is structured so that each nuclear medicine course must be taken in a specific order and each course if offered only once per year. Thus, students who do not achieve the required grade must wait a full year to retake the class and thus delay their graduation by one year. This occurs in about 5% of students per year.

5) **On average, how long does it take a student to graduate from the program?**

Because of the structured curriculum, students who start the professional sequence of courses in the program will graduate in three years. All students remain on campus for six semesters and then complete a two semester internship off campus.

E. **Access**

1) **Describe and assess the program's actions to make itself accessible to students.**

The program is offered on both the Big Rapids and Grand Rapids campuses. Students in the Grand Rapids campus take their general education courses at Grand Rapids Community College and therefore the entire program can be completed in Grand Rapids.

Lab sections are offered at various times to accommodate differing student schedules. All courses in the program are enhanced by FerrisConnect. Most classes are offered face to face although some are offered in the mixed delivery or the fully on-line formats. During internship, courses are fully on-line via FerrisConnect.

The NMT BS completion degree program is not a lock step program. Students may enroll in one or more courses per semester. Progression is at the student's discretion. Professional courses are offered via FerrisConnect.

2) **Discuss what effects the actions described in (1) have had on the program.**

Program visibility and enrollment is significantly increased by offering the program at two campuses. The completion degree is valuable as well because it is offered fully on-line allowing technologists from all across the country to enroll and earn their bachelor's degree.

3) **How do the actions described in (1) advance or hinder program goals and priorities?**

The design of the program advances the goals and priorities of the program by allowing greater flexibility and enhancing learning. The lecture and laboratory coursework prior to internship better prepares students for their clinical experience. FerrisConnect has enhanced both the on-campus and off-campus courses.

F. Curriculum

Curriculum check sheets and example syllabi may be found in Appendices A and B.

1) Program requirements

Prerequisites:

The program does not include prerequisite courses prior to entry into the professional sequence. Students must meet qualifications (i.e. chemistry course with a lab component, math requirement, and cumulative GPA requirement) before applying to the program, but there are no prerequisite courses.

General education courses:

Students are required to successfully complete the following general education courses for the BS degree in NMT:

Course	Rationale
FSUS 100, Freshman Seminar	FSU requirement for first year students
MATH 116, Intermediate Algebra & Numerical Trigonometry	Fulfills FSU math requirement for BS degree; Prerequisite for PHYS 211
ENGL 150, English 1	Fulfills FSU communications requirement for BS degree; Prerequisite for ENGL 250
ENGL 250, English 2	Fulfills FSU communications requirement for BS degree; Prerequisite for ENGL 321
ENGL 321, Advanced Composition	Fulfills FSU communications requirement for BS degree; Fulfills CAHS core curriculum requirement
COMM 105, COMM 121 or COMM 221, Communications Courses	Fulfills CAHS core curriculum requirement
Social Awareness Foundation Course	Fulfills FSU social awareness requirement
Social Awareness Elective	Fulfills FSU social awareness requirement
Social Awareness 200+ Elective	Fulfills FSU social awareness requirement
Cultural Enrichment Elective	Fulfills FSU cultural enrichment requirement
Cultural Enrichment Elective	Fulfills FSU cultural enrichment requirement
Cultural Enrichment 200+ Elective	Fulfills FSU cultural enrichment requirement

Students in the BS degree program must also meet computer competency.

Education in Health and Basic Sciences:

Students are required to successfully complete the following courses for the BS degree in NMT (excluding NUCM courses):

Course	Rationale
MRIS 102, Orientation to Medical Vocabulary	Accreditation requirement
CCHS 101, Orientation to Health Care	Fulfills CAHS core curriculum requirement;

	accreditation requirement
CCHS 102, Safety Issues	Fulfills CAHS core curriculum requirement
CHEM 114, Introduction to General Chemistry	Fulfills FSU scientific understanding requirement for BS degree; prerequisite for BIOL 205; accreditation requirement
BIOL 205, Human Anatomy & Physiology	Fulfills FSU scientific understanding requirement for BS degree; accreditation requirement
PHYS 211, General Physics 1	Accreditation requirement
PHYS 212, General Physics 2	Accreditation requirement
CCHS 315, Epidemiology and Statistics	Accreditation requirement
HCSA 336, Supervisory Practices for Health Care Workers	Accreditation requirement

2) Has the program been significantly revised since the last review, and if so, how?

The AAS degree was eliminated since the last review. The BS degree has not been significantly revised since the last review.

3) Are there any curricular or program changes currently in the review process?

Faculty and administration have begun discussing changes to the curriculum due to changes in accreditation didactic requirements.

4) Are there any plans to revise the current program within the next three to five years?

The curriculum will be revised in the next few years so that the program remains in compliance with the new accreditation standards. The primary change that needs to be made is that new prerequisite classes must be added to the program.

G. Quality of Instruction

1) Discuss student and alumni perceptions on the quality of instruction.

Student Perspectives of Instruction

NMT students rate the quality of instruction in the program very high. All of the respondents from the current student survey reported that they were either satisfied or very satisfied with the quality of both lecture and lab instruction.

Graduate/Alumni Assessment of instruction

Graduates also rate the quality of instruction in the NMT program very high. 98% of graduating students said that they were either satisfied or very satisfied with the quality of lab instruction. 95% of graduating students said that they were either satisfied or very satisfied with the quality of lecture instruction.

2) **Discuss advisory board and employer perceptions of the quality of instruction.**

The advisory board members are also pleased with the NMT program. When asked if the faculty are meeting the needs of the students, all of the respondents indicated a response of "Acceptable" or better.

3) **What departmental and individual efforts have been made to improve the learning environment, add and use appropriate technology, train and increase the number of undergraduate and graduate assistants, etc.?**

Technology is used extensively in classrooms and labs. Faculty actively seek donations of equipment and supplies for the laboratory. Clinical affiliates and radiopharmacies regularly donate equipment and supplies to the program. The program also recently purchased a refurbished scintillation camera for the Big Rapids laboratory.

4) **Describe the types of professional development faculty have participated in, in efforts to enhance the learning environment.**

Faculty members regularly attend Faculty Center for Teaching and Learning sessions as well as the College of Health Professions Best Practices Day. All three faculty members have attended and presented at the Lilly North Conference. Faculty are all members of the Society of Nuclear Medicine and Molecular Imaging (SNMMI) and have attended regional SNMMI meetings and educational seminars. In addition, Sheila MacEachron is a Quality Matters facilitator and reviewer and is very involved in university initiatives to improve on-line instruction.

5) **What efforts have been made to increase the interaction of students with faculty and peers?**

There is extensive interaction between faculty and students because of the small number of faculty in the program and the sequential nature of the curriculum. In addition, faculty are involved in social and service activities of the Nuclear Medicine Association, a registered student organization. Faculty also interact with students during College of Health Professions activities such as open houses, family days, picnics and group advising sessions.

6) **Discuss the extent to which current research and practice regarding inclusive pedagogy and curriculum infuse teaching and learning in this program.**

The program faculty use information obtained through professional development and accrediting bodies to evaluate teaching and course content. Student centered learning concepts are utilized where applicable and a variety of instruction and evaluation methods are used. Required skills and techniques are evaluated using a competency model which allows for a more thorough mastery of the material.

7) **What efforts have actions described in (5) & (6) had on the quality of teaching and learning in the program?**

The quality of teaching and learning has improved in the program with the inclusion of new teaching and assessment methods. Relationships between faculty and students are strong due to the frequent interactions in and outside of the classroom.

H. Composition and Quality of Faculty

1) List the names of all tenured and tenured-track faculty by rank:

Sheila MacEachron, MS, CNMT

- Associate Professor, tenured
- Ferris State University since 1994
- Distinguished Faculty Award, 2002
- MS, Career and Technical Education, Administration Option
- BS, Nuclear Medicine Technology
- AAS, Dental Assisting
- CNMT, Nuclear Medicine Technology Board Certified

Tracy Glentz, MS, CNMT

- Assistant Professor, tenured
- Clinical Coordinator
- Ferris State University since 2004
- MS, Career and Technical Education
- BS, Health Administration
- AAS, Nuclear Medicine Technology
- CNMT, Nuclear Medicine Technology Board Certified

2) Workload

a. What is the normal annualized workload in the program or department? Indicate the basis of what determines a "normal" load. On a semester by semester basis, how many faculty accept overload assignments.

The normal annualized workload for the NMT program is 36 contact hours. All faculty members accept overload assignments, although not necessarily every semester.

b. List activities for which faculty receive release time.

Release time is given for Program Coordination and Clinical Coordination. Additional release time is given for writing accreditation self study reports and the Academic Program Review.

3) Recruitment

a. What is the normal recruiting process for new faculty.

The program utilizes the Ferris State University process for recruiting faculty. The position is advertised through newspaper and trade journals and through working within the professional community.

b. What qualifications are typically required for new faculty?

- 3 years of NMT experience
- CNMT and/or ARRT certifications
- Master's Degree

- Prior teaching experience preferred

d. What are the program's diversity goals for both gender and race ethnicity in the faculty.

The program does not have specific diversity goals for gender and race/ethnicity in the faculty. The best qualified applicant who meets the hiring standards will be offered the position.

e. Describe and assess the efforts being made to attain goals in (c).

Not applicable

4) Orientation

a. Describe and assess the orientation process for new faculty.

New faculty attend the New Faculty Orientation program hosted by the Faculty Center for Teaching and Learning. This program introduces new faculty to the University as well as teaching and education. It also includes such topics as diverse populations of students and diverse culture of faculty. Mentoring support from experienced faculty members is available. In addition, new faculty are required to attend new faculty orientation session conducted by COHP.

5) Reward Structure

a. Describe the reward structure in the program/department/college as it relates program faculty.

The College of Health Professions maintains a Promotion / Merit and Tenure policy outlining the advancement procedures within the college for tenure track faculty. All faculty within the NMT program work toward accomplishing requirements in the areas of teaching, scholarship and service.

In addition to salary, the faculty are rewarded with departmental and college funds to offset travel to professional meetings. Faculty are encouraged to apply through the Dean's Office for COHP funding. The reward is limited to $500 for faculty member per year. Faculty members are also encouraged to apply for Timme Grant funding. Departmental incentive funds have been available on a limited basis to offset the cost of travel for professional development. Faculty may also earn PDI funds by attending programs offered through the Faculty Center for Teaching and Learning.

b. Does the existing salary structure have an impact on the programs ability to recruit and retain faculty?

The existing salary structure does have an impact on the program's ability to attract and retain faculty. The qualifications and experience needed for an applicant to be eligible to teach will place them in the high end of the pay structure at a healthcare facility. NMTs who hold advanced degrees (beyond the current terminal degree of a BS in NMT) earn considerably more than an educator in NMT. These individuals are often in administrative positions. According to a 2006 survey conducted by the Nuclear Medicine Technology Certification Board, NMTs with a Master's degree earn a median annual base salary of

$72,800. Those with a B.S. degree earn $62,788. In contrast the median annual base salary of a Program Director is $67,000 and a faculty member is $60,550.

c. Is the reward structure currently in place adequate to support faculty productivity in teaching, research, and service.

The reward structure currently in place is adequate to support faculty productivity in teaching, research and service.

d. Is enhancing diversity and inclusion a component of the reward structure?

Enhancing diversity and inclusion is not part of the reward structure.

6) Graduate Instruction

This section is not applicable to the NMT program.

7) Non-Tenure-Track and Adjunct Faculty

a. Please provide a list for the last academic year of full-time non-tenure-track and adjunct faculty who taught courses in the program.

Timothy Vander Laan, Temporary Full Time Faculty

- Program Coordinator
- Instructor for FSU since 2007
- Primary location is the Grand Rapids campus
- MPA, Public Administration
- BA, Psychology
- AAS, Nuclear Medicine Technology
- CNMT, Nuclear Medicine Technology Board Certified

b. What percentage of program courses is taught by the faculty in (a)? What courses are they teaching?

36% of course sections were taught by Tim Vander Laan during the 2011-2012 academic year. Tim has taught all nuclear medicine technology courses except NUCM 340, NUCM 360, and NUCM 380.

c. Describe the required qualifications (academic and experiential) for faculty listed in (a). Indicate if all faculty have met the criteria, and if not, what is being done to resolve the situation?

In order for non-tenure-track and adjunct faculty to teach in the NMT program, they must:

- Hold current CNMT and/or ARRT certification
- Be a graduate of an accredited NMT program

Tim Vander Laan meets the criteria as listed above.

d. Does the program consider the current use of non-tenure-track faculty to be appropriate? Why or why not?

The use of non-tenure-track and adjunct faculty are considered appropriate, as needed, by the program faculty.

e. If the program is accredited, what position if any does the accrediting body have regarding the use of non-tenured and adjunct faculty?

The accreditation body for NMT, the Joint Review Committee on Educational Programs in Nuclear Medicine Technology, does not take a specific stance on the use of non-tenure-track and adjunct faculty. They do mandate that courses are taught by nuclear medicine technologists with proper credentials and experience.

I. Assessment and Evaluation

1) List and describe student learning outcomes at the course level.

Course Level Assessment is found in Appendix C

2) List and describe student learning outcomes at the program level.

Program Level Assessment is found in Appendix D

3) Submit a curriculum map and an explanation of how program outcomes are achieved through course curriculum.

Curriculum Map is found in Appendix E

4) Identify how learning outcomes at the course level are measured. Include analysis regarding how well students are meeting course level outcomes.

Learning outcomes at the course level are measured through assessment methods developed by the faculty for each course. Program faculty have chosen one or more assessment methods for each course learning objective. At the conclusion of each semester the results of the assessment is analyzed and entered into TracDat.

Overall, students are consistently meeting course level outcomes as seen in Appendix C.

5) Identify how learning outcomes at the program level are measured. Include analysis regarding how well students are meeting program level outcomes.

Learning outcomes at the program level are measured through analysis of certification exam results and consultation with the advisory board. The advisory board members work with FSU interns and graduates and are thus able to provide the program with valuable information about the quality of program graduates.

Overall, students are consistently meeting course level outcomes as seen in Appendix D.

6) **Describe how assessment results at the course and program levels have assisted in making decisions about pedagogy, learning outcomes, and other course and/or program level actions.**

Program and course assessment is discussed at faculty meetings and at advisory committee meetings. Effective solutions are then developed when weaknesses are identified through assessment. Assessment revealed that many students were not receiving enough clinical experience in the advanced imaging specialty of positron emission tomography (PET). Faculty responded by contacting adjunct clinical instructors and mobile PET providers in Michigan. Clinical rotations and curriculum requirements were then developed to ensure that each student received adequate hands-on experience in PET imaging.

7) **List and describe what variables are tracked and why when assessing the effectiveness of the program (e.g. mastery of essentials of subject area, graduation rates, employment rates, pass rates on professional exams).**

One key variable that the program tracks is certification exam pass rate. This variable is extremely important because it allows the faculty to assess whether the program is giving our graduates the knowledge base that is necessary for them to pass the certification exams.

Another key variable that is tracked is student competency during internship. Students must master a set number of clinical procedures during each semester of internship. Students that are unable to meet the required number of competencies cannot continue on in the program.

8) **Provide trend data for the variables listed in (1). Compare the data to accreditation benchmark standards if applicable, or provide some other type of assessment of the data.**

Nuclear Medicine Technology course assessment data shows that overall the assessment criteria are being met in each course. Occasionally there have been results from particular courses that did not meet the required criteria, but there are no trends showing consistent failure to meet the required criteria in any course. This indicates that course outcomes are consistently being met.

9) **Describe how the trend data in (2) is used to assess the rigor, breadth, and currency of the degree requirements and curriculum.**

Nuclear Medicine Technology program assessment data shows that the degree requirements and curriculum are both current and effective. The most important assessment method is student certification exam scores. The data shows that pass rates on the certification exams have risen in recent years. The pass rate for the first class to graduate from the bachelor's degree program in 2011 was 94%. The pass rate for the second class to graduate from the bachelor's degree program in 2012 was 98%. This is a significant improvement from previous years and it represents pass rates that are above the national average.

10) **Describe how the trend data in (2) is used to assess the extent to which program goals are being met.**

The assessment data as well as the survey data show that the program's goals are being met. Graduates are well prepared for the certification exams. Students and graduates report that the courses are relevant and the program objectives are being met. Advisory committee members state that students have a strong understanding of the field when they graduate and that the program is continually reviewed and improved to keep up with changes in the field.

J. Service to Non-Majors

The NMT program does not provide service courses for other majors.

K. Degree Program Cost and Productivity Data

Student Credit Hours

Year	Summer	Fall	Spring	F+Sp
2007-08	189	756	601	1357
2008-09	185	832	728	1560
2009-10	295	709	703	1412
2010-11	603	794	811	1605
2011-12	747	827	852	1679

Full Time equated Faculty

Year	Summer	Fall	Spring	Avg. F+Sp
2007-08	0.88	2.25	2.85	2.55
2008-09	1.80	2.77	3.01	2.89
2009-10	2.42	2.71	3.44	3.08
2010-11	3.10	3.13	3.78	3.45
2011-12	2.99	2.81	3.00	2.90

SCH/FTE

Year	Summer	Fall	Spring	F + Sp
2007-08	214.49	336.00	210.88	532.16
2008-09	102.78	300.44	241.70	539.68
2009-10	121.90	261.52	204.36	459.10
2010-11	194.52	253.85	214.55	464.69
2011-12	249.83	294.04	284.32	578.05

Discussion

The degree program cost is relative to the equipment intensive labs, required instructor to student ratio in lab and mandated class size. The SCH/FTE value of 578.05 for 2011-2012 is significantly above the College of Health Professions average of 491.43.

L. Administration Effectiveness

1) **Discuss the adequacy of administrative and clerical support for the program.**

The administrative and clerical support for the NMT is adequate. The program has a dedicated department head and secretary for the Dental Hygiene and Medical Imaging Programs.

2) **Are the program and/or department run in an efficient manner?**

The program faculty feel the program and department are run in an efficient manner.

3) **Are class and teaching schedules effectively and efficiently prepared?**

Teaching schedules are prepared by the Department Head with input from the faculty in an efficient manner.

4) **Are students able to take the courses they need in a timely manner?**

The professional courses are sequential and offered once per year for the on campus BS degree program. Courses for the completion degree are offered as needed. All students are able to enroll in the required courses in a timely manner.

Section 4: Facilities and Equipment

A. Instructional Environment

1) **Are current classrooms, labs, and technology (both on-campus and at off-site locations) adequate?**

All classrooms in the VFS building in Big Rapids have been updated and now have "smart stations". This has been a great addition allowing many new functions to be used with teaching. The lab in Big Rapids is very functional but unattractive due to outdated paint and flooring. Technology in the lab is up-to-date and functional. A refurbished scintillation camera has recently been installed in the lab and will greatly enhance lab instruction.

The Grand Rapids facilities are also excellent. Classroom and lab facilities are modern and adequate for the needs of the program.

2) **How does the condition of current facilities impact program delivery?**

Current classroom and lab facilities greatly enhance program delivery.

3) **Describe the program's projected needs with respect to instructional facilities.**

Instructional facilities in the college meet the needs of the program.

4) **Describe current plans for facilities improvements and indicate their status.**

Currently the program has no plans for facilities improvements.

5) **Describe how proposed changes or improvements to facilities would enhance program delivery.**

There are no new plans to change the facility.

B. Computer Access and Availability

1) Identify the computing resources that are allocated to this program.

The Nuclear Medicine labs in Big Rapids and Grand Rapids have several computers that are used exclusively for lab activities such as quality control procedures and image processing. Students must use the FLITE library for personal computing needs such as research or homework. The college does have two classrooms with 24 computers each for class instruction or testing. The Grand Rapids campus has computer labs that can be utilized by students as well.

2) Discuss how these resources are used.

The computers in the Nuclear Medicine labs are used for laboratory instruction only. The Allied Health computer labs may be used by students during a class in session or for testing as needed by faculty.

3) Discuss the adequacy of these resources.

The current computer resources are adequate.

4) Does and acquisition plan currently exist?

There are no plans to obtain more computer resources for students.

5) Discuss the efficacy of online services available to the program.

All program faculty use FerrisConnect to enhance face to face courses and to teach mixed delivery and online courses.

6) Discuss the adequacy of computer support, including the support of online instruction if applicable.

TAC does a great job addressing technology issues in a timely manner.

C. Other Instructional Technology

1) Identify other types of instructional resources that are allocated or available to the program.

The NMT program has a variety of scintillation cameras, well counter, uptake probes, and survey meters. The lab equipment is the same type that is found in nuclear medicine departments around the state.

2) Discuss how these resources are used.

The equipment is used extensively in lab so that students gain hands-on knowledge of these instruments making the transition to internship much easier.

3) **Discuss the adequacy of these resources and identify needed additional resources.**

The resources available are state-of-the-art and very adequate.

4) **Does an acquisition plan to address these needs currently exist?**

The acquisition plan has allowed the program to obtain needed resources.

5) **Discuss the impact of adequacy of other types of instructional technology resources and support of these resources on the program.**

There are no other types of instructional technology resources utilized by the NMT program.

D. **Library Resources**

1) **Discuss the impact of adequacy of other types of instructional technology resources and support of these resources on the program.**

FLITE provides a valuable service to Nuclear Medicine Technology students. There are adequate numbers of print and electronic sources of information for the students. Of particular importance is that students can access the Federal Depository Library for U.S. Government Documents. Since the field of nuclear medicine is heavily regulated by government agencies, access to these documents is mandatory. The ability to access professional journals on FLITE's electronic database is a very big asset to the program as well.

2) **Discuss the service and instruction availability provided by the Library faculty and staff with respect to the needs of the program.**

The FLITE faculty and staff have been great. They provide tours and educational programs for the NMT students enrolled in FSUS 100.

3) **Discuss the impact of the budget allocation provided by FLITE to your program. Is the budget allocation adequate?**

The budget and resources at FLITE have been excellent.

Section 5: Conclusions

A. Relationship to Mission

The Nuclear Medicine Technology Program's mission and goals continue to support those of the university. The program is considered a national leader by their accrediting body, the Joint Review Committee on Educational Programs in Nuclear Medicine Technology. See Appendix F: JRCNMT Initial Site Visit Response July 2013.

B. Program Visibility and Distinctiveness

The Nuclear Medicine Technology program is the only bachelor's degree program in the state. Students interested in a health care profession that involves technical skills, patient contact, computer proficiency and radiation handling are drawn to this field. Many of the students come from other curricula such as pre-medicine, pre-pharmacy and applied biology. The program offers these students an option without having to leave Ferris State University.

The Nuclear Medicine Technology program is unique in its laboratory facilities. During the exit interview of the accreditation site visit in summer of 2013, the site visitors stated that we have the best laboratory facilities of any nuclear medicine program in the country. The labs are a great asset to the program and are used extensively to give students hands-on experience prior to their clinical internship.

C. Program Value

One clear value of the Nuclear Medicine Technology program is that it is the only program in Michigan outside of the Detroit area. Our students come from all across the state. We offer a bachelor's degree while most programs in the country are associate or certificate level. The Society of Nuclear Medicine and Molecular Imaging is advocating for the requirement that entry-level technologists have a bachelor's degree due to the increasing complexity of the field. The bachelor's degree allows the faculty the classroom and laboratory time needed to teach the essential concepts of nuclear medicine.

Another value of the program is the amount of clinical experience students receive prior to internship. The two semester full-time internship prepares them for employment immediately after graduation. In fact, many students are offered jobs at the hospital they interned at after graduation. The accreditation site visitors listed our internship model as one of the strengths of our program.

D. Enrollment

Enrollment in the Nuclear Medicine Technology program continues to be strong. The number of students admitted to the program fluctuates each year depending upon demand, job availability, and the number of internship spots available.

E. Characteristics, Quality and Employment of Students

The quality of NMT graduates is very high. Beyond the necessary skills learned on campus and during internship, the program places a strong emphasis on both professionalism and critical thinking. Adjunct clinical instructors have been impressed with the quality of our students during internship.

Although there has been a recent decline in NMT job availability, graduates that are willing to relocate outside of Michigan have better employment opportunities.

F. Quality of Curriculum and Instruction

The quality of the curriculum is very high. The curriculum is guided by the comprehensive requirements of our accrediting body. The advisory committee made up of professionals in the field has also assisted in shaping the curriculum and methods of instruction. The accelerated format of the program allows students to graduate and get into the workforce much quicker than a traditional program. Survey results also indicate that the quality of lecture and lab instruction is very high.

G. Composition and Quality of the Faculty

All three faculty members are dedicated to their responsibility of training successful nuclear medicine technologists. The faculty are all credentialed and have professional experience as nuclear medicine technologists. They are highly involved in various professional development activities. The adjunct clinical instructors who supervise the students during internship do a great job teaching students the necessary clinical skills and communicating with the program faculty.

Appendix A: Curriculum check sheet

FERRIS STATE UNIVERSITY
COLLEGE OF HEALTH PROFESSIONS
Nuclear Medicine Technology – Bachelor of Science

YEAR 1

Fall Semester	Grade	Fall Semester	Grade
CCHS 101 Orientation to Health Care	3	ENGL 250 English 2	3
CHEM 114 Intro to General Chemistry	4	NUCM 215 Nuclear Medicine Imaging 1	3
FSUS 100 Freshman Seminar, if required	1	NUCM 216 Nuclear Medicine Imaging 1 Lab	1
MATH 116 Inter. Algebra & Numerical Trig.	4	PHYS 212 Introductory Physics 2	4
MRIS 102 Orient. to Medical Vocabulary	1	Cultural Enrichment Elective	3
NUCM 100 Introduction to Nuclear Medicine	1	Social Awareness Elective	3
NUCM 101 Practical Math. in Nuclear Medicine	1		**17**
	15		
Spring Semester		**Spring Semester**	
BIOL 205 Human Anatomy & Physiology	5	CCHS 315 Epidemiology and Statistics	3
CCHS 102 Safety Issues in Health Care	1	ENGL 321 Advanced Composition	3
COMM 105 Interpersonal Communications **OR**		HCSA 336 Supervisory Practices for Hlth Care	
COMM 121 Principles of Public Speaking **OR**		Workers	4
COMM 221 Small Group Decision Making	3	NUCM 320 Nuclear Medicine Imaging 2	3
ENGL 150 English 1	3	NUCM 321 Nuclear Medicine Imaging 2 Lab	1
NUCM 110 Principles of Nuclear Medicine	3	Social Awareness Elective (200+ level)	3
NUCM 111 Principles of Nuclear Medicine Lab	1		**17**
	16		
Summer Semester		**Summer Semester**	
NUCM 205 Nuclear Medicine Instrumentation	3	NUCM 340 Advanced Imaging Techniques	3
NUCM 206 Nuclear Medicine Instrumentation Lab	1	NUCM 350 Advanced Nuclear Cardiology	2
NUCM 240 Cross Sectional Imaging	1	NUCM 351 Advanced Nuclear Cardiology Lab	1
PHYS 211 Introductory Physics 1	4	NUCM 360 Mgt. & Leadership in NMT	3
Cultural Enrichment Elective	3	NUCM 380 Diagnostic Imaging Techniques	3
Social Awareness Foundation	3	Cultural Enrichment Elective (200+ level)	3
	15		**15**

YEAR 3

Fall Semester	Grade		
NUCM 480 Research Methodology	2		
NUCM 493 Clinical Application in NMT 1	10		
	12		
Spring Semester			
NUCM 494 Clinical Application in NMT 2	10		
NUCM 499 Capstone in NMT	2		
	12		

CAHS Computer Competency requirement. Requirement can be met through successful completion of all NUCM courses.

One course from Social Awareness or Cultural Enrichment must meet the Global Consciousness Requirement, **and** one course from Social Awareness or Cultural Enrichment must meet the Race, Ethnicity, and/or Gender requirement.

All first-time-in-any-college freshman (FTIAC) must complete a one credit FSUS 100 requirement. FTIAC is defined as any freshman who has completed less than 12 credits at another higher education institution, excluding credits earned in dual enrollment, advanced placement, or proficiency testing such as CLEP. All FTIAC's are required to complete FSUS 100 their first term at the University.

A total of 120 credits are required for a Bachelor of Science degree at Ferris State University. Additional courses may be required in order to meet this requirement.

120 Semester Hours Required for Graduation

Appendix B: Example Syllabi

Ferris State University
College of Health Professions
Department of Dental Hygiene and Medical Imaging
Nuclear Medicine Technology Program

Course Title:	Nuclear Medicine Imaging I		
Course Number:	NUCM 215		
Semester Hours:	Three Credits		
Prerequisite:	NUCM 205, 206, and 240 Concurrent with NUCM 216		
Semester:	Fall, 2012		
Classroom:	ATC 132	M W	9:00-10:15 am 9:00-10:15 am
Instructor:	Tim Vander Laan		
Office:	ATC 132B		
Telephone:	616-643-5751		
E-Mail:	vand118@ferris.edu		
Office Hours:	Monday Tuesday Wednesday	10:30 am – 1:00 pm 11:00 am – 4:00 pm 10:30 am – 1:00 pm	

Required Textbooks:

Nuclear Medicine and PET/CT Technology and Techniques, 7th edition, Paul E. Christian, and Kristen M. Waterstram-Rich, The C.V. Mosby Co., 2011.

Supplemental Reading:

1. Nuclear Medicine Instrumentation, 1st edition, Jennifer Prekeges, Jones and Bartlett Publishers, 2009.
2. Course Instructor Handouts
3. Internet

Required Materials:

1. Computer access for FerrisConnect and internet (provided by student)
2. Three-ring binder (provided by student)
3. Scientific calculator, Texas Instrument 30 or 35 ONLY, (provided by student)

4. Black ink pens (provided by student)

Course Description:

This course is the first of two courses applying the principles and practices of Nuclear Medicine to imaging procedures used in the clinical setting. Emphasis will be placed on patient care and safety, radiopharmaceuticals and radiation therapy.

Course Outcomes:

1. To identify the methods of communicating with a diverse patient population.
2. To provide the tools necessary to ensure patient safety.
3. To differentiate between the various radionuclide therapies and their radiopharmaceuticals.
4. To describe the methods of preparing radiopharmaceuticals and the quality control methods utilized.
5. To indicate the Biorouting for various radionuclides and radiopharmaceuticals.

Course Outline:

1. Patient communication and interactions
    a. Pediatric patients
    b. Geriatric patients
2. Verification, identification, assessment and medical records
    a. Patient identification and assessment
    b. Medical records
3. Patient transport and safety.
    a. Body mechanics
    b. Transfers
4. Infection control.
    a. BBP
    b. Infection control
5. Patient support.
6. Routes of administration.
7. Introduction to radionuclide therapy.
8. Introduction to radiopharmaceuticals.
    a. Tc-99m Sodium Pertechnetate
    b. Tc-99m radiopharmaceuticals
    c. Other radiopharmaceuticals
9. Radiation protection and regulations in reference to radiopharmaceuticals.
    a. NRC guidelines
    b. FDA guidelines
10. Food and Drug Administration control of pharmaceuticals.
11. Radiation exposure to Nuclear Medicine patients.
12. Adverse reactions.
    a. Radiopharmaceuticals
    b. Other reactions
13. Radiochemistry
    a. Reactor produced radionuclides
    b. Accelerator produced radionuclides
    c. Oxidized Technetium complexes
    d. Reduced Technetium complexes

14. Quality control for radiopharmaceuticals.
    a. Radionuclidic purity
    b. Radiochemical purity
    c. Chemical impurities
    d. Microbiologic testing
    e. Particle sizing
15. Preparing Tc-99m labeled kits.
    a. Cold kits
    b. Hot kits
16. Dose determination.
    a. Dose calibrator measuring instrument
    b. Patient dose ranges
17. Biorouting.
    a. Technetium radiopharmaceutical distribution
    b. Tc-99m sodium pertechnetate (NaTco4)
    c. Technetium Compound Radiopharmaceutical distribution
    d. Other radiopharmaceutical distribution
18. Individual radiopharmaceuticals.
    a. Tc-99m compounds
    b. Others
19. Thyroid non-imaging procedures.
20. Radionuclide therapy.
    a. I-131 therapy for hyperthyroidism
    b. I-131 therapy for thyroid cancer
    c. P-32 therapy
    d. Sr-89 therapy
    e. Sm-153 therapy
    f. Zevalin and Bexxar (monoclonal antibodies)
    g. Y-90 microsphere therapy

Course Calendar:

This calendar is tentative and subject to change depending upon the progress of the class.

Week	Date	Lecture/Assignments
Week 1	M, Aug. 27	Introduction, Syllabus, Assignment Descriptions
	W, Sept. 29	BBP & Infection Control
Week 2	M, Sept. 3	No Class – Labor Day
	W, Sept. 5	Venipuncture & Routes of Administration **BBP Test**
Week 3	M, Sept. 10	Patient Communication and Interactions
	W, Sept. 12	Patient Support **Module 1 in class**
Week 4	M, Sept. 17	Regulation of Radiopharmaceuticals
	W, Sept. 19	**Test 1**
Week 5	M, Sept. 24	Introduction to Radiopharmaceuticals Preparing Tc-99m Labeled kits
	W, Sept. 26	Radiochemistry **Module 2 due**
Week 6	M, Oct. 1	Radiochemistry

	W, Oct. 3	Radiopharmaceutical QC
Week 7	M, Oct. 8	Radiopharmaceutical QC
	W, Oct. 10	USP 797
Week 8	M, Oct. 15	**Test 2**
	W, Oct. 17	Adverse Reactions and Radiopharmaceutical Safety
Week 9	M, Oct. 22	Methods of Localization
	W, Oct. 24	Tc-99m Biorouting
Week 10	M, Oct. 29	Diagnostic Radiopharmaceuticals **Module 3 due**
	W, Oct. 31	Diagnostic Radiopharmaceuticals Non-Imaging Procedures
Week 11	M, Nov. 5	Non-Imaging Procedures
	W, Nov. 7	**Test 3**
Week 12	M, Nov. 12	Thyroid Gland Thyroid Diseases **Module 4 due**
	W, Nov. 14	Thyroid Uptake
Week 13	M, Nov. 19	Thyroid Therapy
	W, Nov. 21	**Test 4**
Week 14	M, Nov. 26	**Presentations**
	W, Nov. 28	**Presentations**
Week 15	M, Dec. 3	Radionuclide Therapy **Module 5 due**
	W, Dec. 5	Radionuclide Therapy Monoclonal Antibodies
Week 16	M, Dec. 10	Final Exam

Evaluation:

Grading: Tests, assignments, etc. are subject to change.

Modules	Five @ 10 points each	50 points
BBP Test	One @ 10 points	10 points
Tests	Four @ 25 points each	100 points
Final Exam (comprehensive)	One @ 50 points	50 points
Presentation Project	One @ 25 points	25 points
Notebook	One @ 10 points	10 points
Total		**245 points**

Grading Scale:

100 – 95%	A	79 – 77%	C
94 – 92%	A-	76 – 74%	C-
91 – 89%	B+	73 – 71%	D+
88 – 86%	B	70 – 68%	D
85 – 83%	B-	67 – 65%	D-
82 – 80%	C+	Below 65%	F

Assignments and Modules:

1. Unless otherwise instructed, all modules must be computer processed. A reduction of 25% will be awarded for handwritten modules. Calculations on specified modules may be handwritten using black ink.
2. Unless otherwise instructed, modules must be handed in to the instructor. A reduction of 25% will be given for modules that are sent electronically.
3. Modules and assignments must be handed in at or before the start of lecture, on the due date in order to receive full credit. Late modules or assignments will be accepted up to 24 hours post due date and time, but will receive a 25% reduction in total points available. No modules or assignments will be accepted after 24 hours for credit.
4. Quotes are unacceptable and zero points will be awarded. Answers should be "in your own words".
5. Duplicate answers (i.e. from another student) are unacceptable and may be viewed as cheating. No points will be awarded for duplicate answers.
6. If you have a "conflict" with a question/answer after the module, assignment, or test has been graded, you must see the instructor within one week of the time the instructor handed it back. Be prepared to show documentation on why you believe the answer is correct. Points awarded are at the discretion of the instructor.

Course Policies:

Attendance: Attendance is expected at every scheduled lecture session. While it is understood that extenuating circumstances may result in periodic absences, absences resulting in four missed lectures will be deemed excessive. A decrease of 5% of the final grade will be made for every lecture missed that is deemed excessive. The material covered in NUCM 215 is the foundation for future nuclear medicine classes, as well as your career in nuclear medicine technology.

Tardiness: Tardiness in five lecture sessions will be deemed excessive. A decrease of 5% of the final grade will be made for every tardy that is deemed excessive. Five minutes after the start of the lecture is considered tardy.

Class Participation: Class participation is required during discussions. Sleeping during class or lab will result in the student being asked to leave class with that class period being considered an absence.

Cell Phones, Pagers, Beepers, Etc: Electronic devices including cell phones, pagers and beepers are not allowed to be on during class. If extenuating circumstances exist, please talk to the instructor.

Recording Lectures or Labs: Students may not tape record or videotape lectures or labs without the permission of the instructor.

Missed Tests / Examinations: There will be no make-up tests or examinations given unless extenuating circumstances exist. Proof of reason for absence must be provided. The content of the make-up test or examination is at the course instructor's discretion.

Academic Dishonesty: Per Ferris State University, "cheating is defined as using or attempting to use, giving or attempting to give, obtaining or attempting to attain: products or prepared materials, information relative to

a quiz or examination, or other work that a student is expected to do alone and not in collaboration with others. Plagiarism of written work shall also be considered an infraction. The policy may be referred to in the Student Handbook and on the FSU website.

Disruptive Behavior: Disruptive behavior (excessive talking, rudeness, vulgar language, etc) will result in verbal and written warning. A second offense will result in the student being asked to leave that class and that class will be considered an absence. Further offenses will result in disciplinary procedures.

Professionalism: Students are expected to behave in a professional manner in the lecture and laboratory sessions. Professionalism includes respect for the course instructors, respect for peers, behavior that is acceptable in a clinical setting, dressing appropriately in the laboratory setting, etc. Unprofessional behavior will result in the same procedure as disruptive behavior. Any questions regarding professionalism should be directed to the course instructor.

Support Services: Tutoring may be available through Student Development Services. The Academic Skill Center serves all students who need assistance. Appointments may be made with the course instructor for individual assistance. Take advantage of office hours.

Students with Disabilities: If you are a student with a disability or think you may have a disability, contact the Disabilities Services office at 231-591-3057 or email ecds@ferris.edu to discuss your request further. Any student registered with Disabilities Services should contact the instructor as soon as possible for assistance with classroom accommodations.

Communication with Instructor: Please be aware that the course instructor will respond to your emails (best method) and telephone messages in a timely fashion. They will not, however, answer messages in the evenings or on weekends. The instructors have set office hours and will respond during these times if possible. Hours outside of office hours are spent in the classroom, in the laboratory, or in administrative responsibilities. If there is an emergency during the day, please contact the Ferris State-Grand Rapids main office at 616-643-5730.

General Policies: See Student Handbook

FERRIS STATE UNIVERSITY
COLLEGE OF ALLIED HEALTH SCIENCES
NUCLEAR MEDICINE TECHNOLOGY PROGRAMS

NUCM 494 – CLINICAL APPLICATION OF NUCLEAR MEDICINE TECHNOLOGY II
SPRING SEMESTER

COURSE DESCRIPTION: The second of two clinical application courses providing the student with the opportunity to learn basic skills necessary for the production of diagnostic nuclear medicine procedures and performance of therapeutic application or radionuclides. This will be accomplished by review of pervious didactic materials, presentation of new didactic materials, demonstrations, and SUPERVISED clinical laboratory practice and evaluation. 10 Credits; Prerequisites: All prior NUCM courses

CLASS ROOM: Clinical Affiliate Sites

INSTRUCTORS: NMT Program Faculty

REQUIRED MATERIAL:
1. Lab coats (provided by the student)
2. Film badges (provided by the site)
3. Clinical Handbook (to be kept a clinical site at all times)
4. Calculator
5. E-mail address

REQUIRED TEXTBOOKS:

Nuclear Medicine Technology: Procedures and Quick Reference, 2nd edition, Pete Shackett, Lippincott, Williams & Wilkins, 2009.

Nuclear Medicine and PET/CT Technology and Techniques, 6th edition, Paul E. Christian, and Kristen M. Waterstram-Rich, The C.V. Mosby Co., 2007.

Review of Nuclear Medicine Technology: Preparation for Certification Examination, Ann M. Steves, Patricia C. Wells, SNM Publishing, 2004.

GRADING:

400 points	Clinical Performance (based on evaluations and timeliness of required reports)
100 points	Comprehensive final
40 points	Behavioral Traits forms
40 points	Monthly Reports
40 points	Weekly Reports
30 points	Site Visit Papers
250 points	Case Study Presentation (Rubric will be provided)
100 points	Quizzes

1000 Points Total

GRADING SCALE:

100 – 95%	A	79 – 77%	C
94 – 92%	A-	76 – 74%	C-
91 – 89%	B+	73 – 71%	D+
88 – 86%	B	70 – 68%	D
85 – 83%	B-	67 – 65%	D-
82 – 80%	C+	Below 65%	F

EVALUATION:

1. On-site evaluation by staff during the performance of internship tasks
2. On-site evaluation by NMT program faculty during case study presentations
3. Written and verbal tests and case presentations
4. Quizzes
5. Grades will be by letter grade

INSTRUCTIONAL METHODS:

1. Demonstration
2. Instructor assisted procedure performance
3. Instructor supervised procedure performance
4. Lecture
5. Procedure Critique
6. Selected reading assignments

EXAMINATIONS:

1. One multiple choice comprehensive examination from FSU. This final is taken at the Big Rapids or Grand Rapids FSU campus.

PERFORMANCE EVALUATIONS:

1. A minimum of sixteen (16) performance evaluations are required for minimal competency. The performance evaluations must be mastered with a 90% or above. Less than 16 performance evaluations will result in an incomplete for the course.

2. The 16 performance evaluations must consist of the following:
   (5) Imaging Procedure performance evaluations
   (1) Non-Imaging Procedure performance evaluations
   (6) Quality Control/Quality Assurance evaluations
   (2) Radiopharmacy evaluations
   (2) Computer Processing evaluations

COURSE OUTLINE: Please refer to your Ferris Connect course for specific internship objectives and clinical policies.

COURSE OBJECTIVES: Please refer to your Ferris Connect course for specific internship objectives and clinical policies.

GENERAL:

The student is to be presented with a structured, monitored, and education oriented practical experience in which actual patient contact occurs.

This course is designed to familiarize the student with the routine procedures in nuclear medicine which would be performed by entry-level technologists: nuclear instrumentation use and quality control (QC); radiopharmaceutical preparation and QC; quantitation and administration of radiopharmaceutical doses; radiation safety and protection; static, dynamic, and tomographic imaging; in vivo non-imaging; in vitro procedures; patient care and preparation for nuclear medicine examinations; basic administrative and management procedures associated with maintenance of the nuclear medicine department; computer applications; and therapeutic use of radiopharmaceuticals.

ASSIGNMENTS:

1. Case Study. This is a study that you have performed or assisted in performing. It will include the nuclear medicine exam along with two other correlation modalities. You will present your case study during the FSU faculty visit to your internship site where you will be graded on the case study. Case study guidelines can be found in the "Case Study" folder on FerrisConnect.

2. Quizzes. To be taken at your clinical site. Quizzes will be given over FerrisConnect and will be timed. Quizzes will be available to students ONLY on the specified day which is listed on the clinical internship schedule. Quizzes will also ONLY be available to students during the specific times of 1:00 to 3:00 p.m.

   Quiz Content:
   Quiz 1: Cardiovascular, Endocrine, Central Nervous System
   Quiz 2: Gastrointestinal, Genitourinary, Respiratory, Hematopoietic
   Quiz 3: Skeletal, Infection, Oncology, Therapy

3. Weekly Reports, Monthly Reports and Behavior Trait forms, and Evaluation of Clinical Experience forms, which will all be available to you via your FerrisConnect site. (More information below)

4. Student site visits. Each intern will be required to visit three different modalities areas that are outside of your normal nuclear medicine department. The visits will include a visit to:

   a. Radiopharmacy
   b. Another Nuclear Medicine Department
   c. PET Department

   You must schedule these visits on your own. Each visit will be the length of one day (8 hours). After completing the visit, the student will be required to write a one page synopsis of the events that occurred while visiting the other modality. **VISITS ARE ONLY TO BE DONE DURING MARCH.** The synopses papers to be put in your portfolio for review upon submission. See your FerrisConnect site for specific due dates.

5. Evaluations: (5) Imaging procedures, (1) Non-imaging procedure, (6) QC/QA procedures, (2) Computer processing, (2) Radiopharmacy.

6. Homework assignments as needed from Clinical Coordinator or ACI.

Required Reports:

As part of our accreditation policies, it is required that original copies of all documents kept in the student's portfolio and submitted to the Clinical Coordinator at the end of the student's clinical internship. You can access all the documents you need via the FerrisConnect site; you may be required to mail some items to FSU.

Weekly Reports:

- ⇨ You will need to print off a copy of the weekly report and keep track of your hours each week. On Friday of each week as you are completing the form, you will need the signature of your ACI on that form to verify the accuracy of your time as documented on the weekly report form. KEEP THIS FORM AT YOUR SITE IN YOUR PORTFOLIO! IT WILL BE SUBMITTED TO FERRIS AT THE END OF YOUR INTERNSHIP.
- ⇨ If requested, you may be required to report your hours to me via the FerrisConnect e-mail. You can do this by individually filling out the form each week. This way I am able to track your hours. You can send it as an attachment.

Monthly Reports:

- ⇨ Your Monthly reports also need to be printed off and filled out by hand. Original copies are kept in the student's portfolio. It is to be completed on the posted due dates.
- ⇨ If requested, you may be required to electronically fill out the monthly report and e-mail it to me using FerrisConnect to verify your progress.

Behavior Trait Forms:

- ⇨ The Behavior Trait forms must be filled out by *YOU AND YOUR ACI* and kept in your portfolio. Please note: comments, dates and signatures from both you and your ACI are required on this form in order to comply with accreditation requirements.
- ⇨ You are required to scan a copy of the BT form to the Clinical Coordinator for review (under assignment submissions).

Case Study:

- ⇨ The case study is to be presented on the date of FSU faculty visit. You may present a case that follows one patient, or you may choose to present a case study centering on a disease state. The requirements for the case study are as follows:
- ⇨ It must include at least one Nuclear Medicine exam
- ⇨ It must also include TWO other correlating imaging modalities
- ⇨ A case study information sheet will be provided

A copy of your case is to be handed in to the FSU faculty following the presentation.

Ferris State University
College of Health Professions
Department of Dental Hygiene and Medical Imaging
Nuclear Medicine Technology Programs

Course Title:	Capstone in NMT
Course Number:	NUCM 499
Semester Hours:	2 Credits
Prerequisite:	NUCM 480 Must be last NUCM course in professional sequence
Semester:	Spring 2013
Classroom:	FerrisConnect Online
Instructor:	Sheila MacEachron, MS, CNMT
Office:	VFS 405A
Telephone:	231 591-2319
E-Mail:	maceacs@ferris.edu
Office Hours:	T- R 9:30 – 10:30 am, W 1:00 – 2:50 pm, Others by Appointment
Required Textbooks:	None
Supplemental Reading:	All textbooks used in previous NUCM courses. Course instructor handouts Internet materials
Required Materials:	Computer access for FerrisConnect and internet (provided by student)

Course Description:

As the capstone of the baccalaureate program, this course assesses your comprehension of nuclear medicine technology and general education through written assignments.

Course Outline:

1. In-service to hospital personnel regarding Nuclear Medicine Technology.
2. Examination questions.
3. Research project as outlined in NUCM 480.

Course Calendar:

This calendar is tentative and subject to change depending upon the progress of the class.

Week of...	Topic
January 14th	Syllabus **Title and Target Audience of In-Service Presentation** **Due by Thursday at 5:00**
January 21st	Review NUCM 480 Topics
January 28th	**In-Service Presentation Due by Thursday at 5:00**
February 4th	**Peer Feedback Forms Due by Thursday at 5:00** Work on Examination Questions
February 11th	**Examination Questions Due by Thursday at 5:00**
February 18th	Work on Research Project - Set Up **Form 1 Due by Thursday at 5:00**
February 25th	Work on Research Project – References and Data **Form 2 Due by Thursday at 5:00**
March 4th	Week 1 of Research Project **Form 3 Due by Thursday at 5:00**
March 18th	Week 2 of Research Project **Form 4 Due by Thursday at 5:00**
March 25th	Week 3 of Research Project **Form 5 Due by Thursday at 5:00**
April 1st	Week 4 of Research Project **Form 6 Due by Thursday at 5:00**
April 8th	Week 5 of Research Project **Form 7 Due by Wednesday at 5:00**
April 15th	Week 6 of Research Project **Form 8 Due by Thursday at 5:00**
April 22nd	Week 7 of Research Project **Form 9 Due by Thursday at 5:00**
April 29th	Week 8 of Research Project **Form 10 Due by Thursday at 5:00**
May 6th	**Research Project Paper Due by Monday at 5:00**

Research Project Paper:

Forms:

- Forms must be submitted on or before their due date and time. The forms must be submitted via FerrisConnect as attachments. Do not cut and paste into submission box.
- All forms must be word processed.
- Forms submitted up to 24 hours post due date and time will receive a deduction of 25%. Forms submitted more than 24 hours post due date and time will receive zero points. No exceptions.

Paper:

- Paper must be submitted by its due date and time.
- Papers submitted up to 24 hours post due date and time will receive a 25% deduction. Papers received more than 24 hours post due date and time will receive zero points. No exceptions.
- Paper must be word processed, 11 font, and with reasonable (maximum 1") margins.
- Minimum 8 – 10 pages in length not including cover page and reference page. Maximum 15 pages not including cover page and reference page.
- Diagrams, charts, tables, etc will only count for three of the total pages required. Any diagrams, etc beyond three pages are not penalized but will not count toward the minimum number of pages. The student should, however, include all relevant statistical information.
- A minimum of eight references are required. Wikipedia may not be used as a reference.
- Only ½ of your references may be from the internet. Half of your sources must be from books, professional peer-reviewed articles or other appropriate print sources. If you need assistance regarding what is considered appropriate please contact the instructor.
- Pages must be numbered.
- Submit electronically via FerrisConnect.
- Submit as an attachment. Do not cut and paste the paper into the submission box.
- The paper will be graded using the following rubric: PLEASE READ CAREFULLY!
- All grades are final.

Rubric for Research Project Paper

	20 Points	15 Points	10 Points	5 Points	Points Awarded
Question	Posed a thoughtful, creative question that engaged the student in challenging and evidence-based research.	Posed a focused question that involved the student in challenging research.	Constructed a question that lends itself to readily available answers.	Relied on instructor-generated question or developed a question that required little research.	
Information	Gathered information from 8 or more sources, which were relevant, balanced and included critical readings related to the thesis.	Gathered information from 5 – 7 relevant sources.	Gathered information from 3 – 5 sources. Displayed minimal effort in selecting quality resources.	Gathered information from 1 – 3 sources. Information lacked relevance, depth and balance.	
Analysis	Student carefully analyzed the information collected and drew appropriate conclusions supported by evidence. Appropriate statistical application and analysis. Charts, tables, etc were used correctly.	Good effort was made in analyzing the evidence collected. Charts, diagrams, images, etc were used minimally but appropriately.	Conclusions could be supported by stronger evidence. Level of analysis could be deeper. Charts, diagrams, images, etc were used incorrectly or did not reflect the data collected.	Conclusions simply involved restating the information. Conclusions were not supported by evidence. Charts, diagrams, images, etc were absent or incorrect.	
Synthesis	Information was logically and creatively organized with smooth transitions.	Logically organized the material and made good connections between ideas.	Could have put greater effort into organizing the research.	Work was not logically or effectively structured.	
Documentation	All sources were documented and properly cited. Error-free.	All sources were documented and cited. Few errors noted.	Needed to use greater care in documenting sources. Poorly constructed or absent.	Material was clearly not documented and/or plagiarized.	
Process	Effectively and creatively used appropriate communication tools to convey their conclusions and demonstrated thorough, effective research techniques.	Effectively communicated the results of the research.	Needed to work on communicating more effectively.	Little evidence of thoughtful research. Paper does not effectively communicate research findings.	
				Total Points	

Assignments:

In-Service Presentation:

- You will create an in-service PowerPoint presentation for a hospital audience.
- The presentation, for example, could be for ER personnel or for environmental service personnel. The presentation, however, must pertain to all areas of Nuclear Medicine. In other words, the presentation cannot just be about lung imaging. All aspects of imaging must be covered. The "topic" that is due for this presentation should state the title and the target audience.

- The presentation must be submitted in PowerPoint format as well as a word processed "script".
- The presentation should be 20 – 30 minutes in length. The student may need to practice the presentation in order to make sure it meets this criterion.
- The PowerPoint should be visually pleasing.
- The student may use videos or other media if applicable.
- The student will not have to present the information to the specific group. It is, however, highly encouraged for the student to do so.
- Submit the PowerPoint Presentation and the script as separate documents via FerrisConnect.
- Submit as attachments. Do not cut and paste in the submission box for this assignment.
- The course instructor will post all PowerPoint presentations at the same time.
- The PowerPoint will be provided to other class members for feedback. This feedback will be used to calculate 20% of the student's grade.
- The presentation is due on or before its due date and time.
- Late presentations will be accepted up to 24 hours post due date and time but will receive a 25% deduction. Presentations submitted more than 24 hours post due date and time will receive zero points. No exceptions.
- The presentation will be graded using the following rubric. PLEASE READ CAREFULLY.
- All grades are final.

Grading Rubric for PowerPoint Presentation:

					Points Awarded
Topic	Relevant to target audience. 5 Points	Somewhat relevant to target audience. 4 Points	Not relevant to target audience. 3 Points	No clear topic. 0 Points	
Visual Presentation, Including Mechanical Errors (i.e. spelling, grammar)	PowerPoint is visually pleasing; words are limited; pictures, diagrams, etc are well utilized. No mechanical errors. 15 Points	PowerPoint presentation is average in use of color, etc; too many or too few words; over use or under use of graphics. Minimum of two mechanical errors. 12 Points	PowerPoint is not visually pleasing; words and graphics are not utilized well. Three to five mechanical errors. 9 Points	PowerPoint is missing visual components; many errors in words and graphics. Over five mechanical errors. 0 Points	
Information regarding Nuclear Medicine Technology	Information is all inclusive and pertinent. 20 Points	Information is only partially presented. 16 Points	Information is lacking or is not presented in a thorough manner. 12 Points	Information is missing, is presented in an illogical manner or is incorrect. 0 Points	
Peer Feedback	9 – 8.5 average total points received on peer feedback form. 10 Points	8.4 – 7.5 average total points are received on peer feedback form. 8 Points	7.4 – 6.5 average total points are received on peer feedback form. 6 Points	6.4 or below average total points are received on peer feedback form. 0 Points	
Total Points	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXX	

Examination Questions:

- You must create a list of 25 questions that encompass all aspects of Nuclear Medicine Technology.
- The questions should be written in the style of board examination questions.
- The correct answers must be included as well as an explanation as to why this is the correct answer.
- Each question and answer set is worth one point.
- All grades are final.
- Must be word processed.
- You may use examination books, etc for inspiration, style, etc but may not use the questions from these sources.
- Submit electronically via FerrisConnect under assignments.
- Do no cut and paste into the submission box for this assignment. Add as an attachment.
- The assignment is due on or before its due date and time.
- Late assignments will be accepted up to 24 hours post due date and time with a 25% reduction in points. After 24 hours, zero points will be awarded. No exceptions.
- Remember that the goal is to create questions that cover **ALL** aspects of Nuclear Medicine Technology including the following (Must include these topics and be clearly labeled; For example, Nuclear Physics Question 1...):
  - Nuclear physics
  - Instrumentation
  - Radiopharmacy
  - Quality assurance/quality control
  - Diagnostic Nuclear Medicine
  - Therapeutic Nuclear Medicine

Grading:

Assignments:	In-Service Presentation	One (1) @ 50 points
	Peer Feedback Forms	One (1) Set @ 10 points
	Examination Questions	One (1) @ 25 points
Research Project:	Forms	Ten (10) @ 20 points each
	Paper	One (1) @ 120 points
Total:		405 points

Grading Scale:

100 – 95%	A	79 – 77%	C
94 – 92%	A –	76 – 74%	C-
91 – 89%	B+	73 – 71%	D+
88 – 86%	B	70 – 68%	D
85 – 83%	B-	67 - 65%	D-
82 – 80%	C+	65% and Below	F

Course Policies:

Academic Dishonesty: Per Ferris State University, "cheating is defined as using or attempting to use, giving or attempting to give, obtaining or attempting to attain: products or prepared materials, information relative to a quiz or examination, or other work that a student is expected to do alone and not in collaboration with others. Plagiarism of written work shall also be considered an infraction. Students are expected to present the results of their own work except under circumstances in which the professor may have requested or approved the joint effort of a number of students. The penalty for the first offense of willful cheating consists of the student receiving zero for the assignment in which the infraction occurs. However, cheating on quizzes or examinations means failure of the course. The students may appeal the decision to the Disciplinary Committee. Further offenses may result in suspension or dismissal".

Disruptive Behavior: Disruptive behavior (negative emails, slander/libel, rudeness, vulgar language, etc.) will result in a written warning. A second offense will result in disciplinary action that may include dismissal from the course or dismissal from the program.

Professionalism: You are expected to behave in a professional manner. Professionalism includes respect for the course instructors, respect for peers, behavior that is acceptable in a clinical setting, etc. Unprofessional behavior will result in the same procedure as disruptive behavior. Any questions regarding professionalism should be directed to me.

Support Services: Telephone or real time internet appointments may be made with me for individual assistance. Take advantage of office hours. It is **highly advised** to set up a telephone appointment via email so that I am aware that you will be calling.

Communication with Instructor: Please see the Communications Policy in the Start Here section on FerrisConnect.

General Policies:

Please refer to the FSU and/or CHP website for general policies.

Appendix C: Course Level Assessment

Unit Course Assessment Report - Four Column

Ferris State University

Z - NUCM Courses

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
Z - NUCM Courses - NUCM 100 - Intro to Nuclear Medicine - Professional and Ethical Behavior - Demonstrate an understanding of or identify components of the professional expectations of the Nuclear Medicine Technologist (Created By Z - NUCM **Start Date:** 12/14/2009 **Course Outcome Status:** Active	**Assessment Method:** Students write a paper about the "Code of Ethics" in Nuclear Medicine Technology. (Rubric) **Assessment Method Category:** Written Product (essay, research paper, journal, newsletter, etc.) **Criterion for Success:** 90% will receive 75% or higher on the written assignment	12/14/2012 - 38 of 40, 95% **Classification:** Criterion Met **Action:** 1 - No Action Required 12/16/2011 - 38 of 40, 95% **Classification:** Criterion Met **Action:** 1 - No Action Required 01/19/2011 - 54/54 (100%) **Classification:** Criterion Met **Action:** 1 - No Action Required 09/17/2010 - 90% of students earned 75% or higher **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 100 - Intro to Nuclear Medicine - Knowledge & Professional Compentency - Demonstrate an understanding of the professional issues that the Nuclear Medicine Technologist will confront in practice. (Created By Z - NUCM Courses) **Start Date:** 12/14/2009 **Course Outcome Status:** Active	**Assessment Method:** Students create a PowerPoint presentation about the Patient Bill of Rights and how that will affect them as Nuclear Medicine Technologists. (Rubric) **Assessment Method Category:** Presentation(Oral) **Criterion for Success:** 90% will receive 75% or higher on the PowerPoint presentation by the instructor.	12/14/2012 - 39 of 40, 98% **Classification:** Criterion Met **Action:** 1 - No Action Required 12/16/2011 - 40 of 40, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required 01/19/2011 - 51/54 (94%) **Classification:** Criterion Met	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
		Action: 1 - No Action Required	
		09/17/2010 - 90% of students earned 75% or higher **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 101 - Practical Math in Nuclear Med - Knowledge & professional Competency - Performs mathmatical calculations utilized in the clinical practice of Nuclear Medicine Technology (Created By Z - NUCM Courses) **Start Date:** 12/14/2009 **Course Outcome Status:** Active	**Assessment Method:** Students are given a pre-test prior to the first lecture and a post-test after the last lecture of the course. **Assessment Method Category:** Test - Internally Developed - Pre/Post or Post **Criterion for Success:** 90% of the students will receive a higher point value on the post-test than on the pre-test.	12/14/2012 - 41 of 41, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		12/16/2011 - 44 of 44, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		01/19/2011 - 54/54 (100%) **Classification:** Criterion Met **Action:** 1 - No Action Required	
		09/17/2010 - 100% of students earned a higher point value on the post-test than on the pre-test **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 101 - Practical Math in Nuclear Med - Critical Thinking - Differentiates between various mathematical applications utilized in Nuclear Medicine Technology. (Created By Z - NUCM Courses) **Start Date:** 12/14/2009	**Assessment Method:** Students complete a module in which they must apply the correct mathematical application to a clinical scenario. **Assessment Method Category:** Written Product (essay, research paper, journal, newsletter, etc.) **Criterion for Success:**	12/14/2012 - 40 of 41, 98% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		12/16/2011 - 44 of 44, 100% **Classification:**	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
Course Outcome Status: Active	90% of the students will receive 75% or higher on questions 1-3 on module 10.	Criterion Met **Action:** 1 - No Action Required	
		01/19/2011 - 51/54 (94%) **Classification:** Criterion Met **Action:** 1 - No Action Required	
		09/17/2010 - 98% of students earned 75% or higher **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 110 - Prin-Prac of Nuclear Medicine - Knowledge & Professional Competency 1 - Distinguish between the various interactions of matter with gamma radiation. (Created By Z - NUCM Courses) **Start Date:** 12/14/2009 **Course Outcome Status:** Active	**Assessment Method:** Students create a visula presentation of one type of interaction with gamma radiation. Presented to the whole class. (rubric) **Assessment Method Category:** Presentation(Oral) **Criterion for Success:** 90% of the students will earn 75% or higher	05/10/2013 - 35 of 36, 97% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		05/04/2012 - 35 of 36, 97% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		05/06/2011 - 50 of 50, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		01/19/2011 - Not offered fall semester. **Classification:** Inconclusive **Action:** 1 - No Action Required	
		09/15/2010 - 100% of the students received 75% or higher **Classification:** Criterion Met	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
		Action: 1 - No Action Required	
Z - NUCM Courses - NUCM 110 - Prin-Prac of Nuclear Medicine - Knowledge & Professional Competency 2 - Explains the biologic effects of radiation on humans (Created By Z - NUCM Courses) **Start Date:** 12/14/2009 **Course Outcome Status:** Active	**Assessment Method:** Students create a PowerPoint presentation to educate peers about the biologic effect of radiation on humans. **Assessment Method Category:** Presentation(Oral) **Criterion for Success:** 90% of the students will earn 75% or higher	05/10/2013 - 33 of 36, 92% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		05/04/2012 - 48 of 50, 96% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		05/06/2011 - 36 of 36, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		01/19/2011 - Not offered fall semester. **Classification:** Inconclusive **Action:** 1 - No Action Required	
		09/15/2010 - 98% of students earned 75% or higher **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 111 - Prin-Prac of Nuclear Med Lab - Knowledge & Professional Competency - Demonstrate skills required for radiation detection and protection. (Created By Z - NUCM Courses) **Start Date:** 12/14/2009 **Course Outcome Status:**	**Assessment Method:** Students will participate in laboratory sessions throughout the semester and complete check sheets for each session. **Assessment Method Category:** Observations (e.g. Clinical or Field) **Criterion for Success:** 90% of the students will earn 75% or higher	05/10/2013 - 154 of 156, 99% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		05/04/2012 - 167 of 167, 100% **Classification:** Criterion Met	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
Active		**Action:** 1 - No Action Required	
		05/06/2011 - 279 of 283, 98% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		01/19/2011 - Not offered fall semester. **Classification:** Inconclusive **Action:** 1 - No Action Required	
		09/15/2010 - 94% of the students earned 75% or higher **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 111 - Prin-Prac of Nuclear Med Lab - Critical Thinking - Demonstrates the ability to perform various laboratory procedures as required in Nuclear Medicine Technology (Created By Z - NUCM Courses) **Start Date:** 12/14/2009 **Course Outcome Status:** Active	**Assessment Method:** Students will complete one laboratory procedure chosen by random drawing during a laboratory practical. **Assessment Method Category:** Observations (e.g. Clinical or Field) **Criterion for Success:** 90% of the students will earn 75% or higher	05/10/2013 - 35 of 36, 97% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		05/04/2012 - 34 of 35, 97% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		05/06/2011 - 47 of 49, 96% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		01/19/2011 - Not offered fall semester. **Classification:** Inconclusive **Action:** 1 - No Action Required	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
		09/15/2010 - 93% of the students earned 75% or higher **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 205 - Nuclear Med Instrumentation - Knowledge & Professional Competency - Compare and contrast instruments utilized in Nuclear Medicine Technology (Created By Z - NUCM **Start Date:** 12/14/2009 **Course Outcome Status:** Active	**Assessment Method:** Students create a PowerPoint presentation to present to their peers which compares and contasts instruments utilized in Nuclear Medicine Technology. (rubric) **Assessment Method Category:** Presentation(Oral) **Criterion for Success:** 90% of the students will earn 75% or higher	08/08/2012 - 36 of 36, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		08/10/2011 - 45 of 45, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		01/19/2011 - Not offered fall semester. **Classification:** Inconclusive **Action:** 1 - No Action Required	
		09/15/2010 - 98% of students earned 75% or higher **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 205 - Nuclear Med Instrumentation - Critical Thinking - Defferentiate between the various quality assurance/quality control procedures utilized in Nuclear Medicine Technology (Created By Z - NUCM Courses) **Start Date:** 12/14/2009 **Course Outcome Status:** Active	**Assessment Method:** Students will be asked to select the correct quality assurance/quality control procedures to perform during several clinical scenarios. **Assessment Method Category:** Written Product (essay, research paper, journal, newsletter, etc.) **Criterion for Success:** 90% of the students will earn 75% or higher	08/08/2012 - 36 of 36, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		08/10/2011 - 44 of 45, 98% **Classification:** Criterion Met **Action:**	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
	on questions 1-5 on an assignment module.	1 - No Action Required 01/19/2011 - Not offered fall semester. **Classification:** Inconclusive **Action:** 1 - No Action Required 09/15/2010 - 96% of students earned 75% or higher **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 206 - Nuclear Med Instrumentation La - Knowledge & Professional Competency - Demonstrates ability to operate a gamma scintillation camera (Created By Z - NUCM Courses) **Start Date:** 12/14/2009 **Course Outcome Status:** Active	**Assessment Method:** Students participate in a laboratory session in which they deomonstrate their ability to operate the gamma scintillation camera correctly. **Assessment Method Category:** Observations (e.g. Clinical or Field) **Criterion for Success:** 90% of the students will earn 75% or higher	08/08/2012 - 36 of 36, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required 08/10/2011 - 73 of 73, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required 01/19/2011 - Not offered fall semester. **Classification:** Inconclusive **Action:** 1 - No Action Required 09/15/2010 - 100% of students earned 75% or higher **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 206 - Nuclear Med Instrumentation La - Critical Thinking - Differentiates between the various	**Assessment Method:** Students will select the correct instrument to utilize in order to successfully complete	08/08/2012 - 35 of 36, 97% **Classification:** Criterion Met	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
instruments and their utilization (Created By Z - NUCM Courses) **Start Date:** 12/14/2009 **Course Outcome Status:** Active	the laboratory practical **Assessment Method Category:** Observations (e.g. Clinical or Field) **Criterion for Success:** 90% of the students will earn 75% or higher	**Action:** 1 - No Action Required 08/10/2011 - 43 of 45, 96% **Classification:** Criterion Met **Action:** 1 - No Action Required 01/19/2011 - Not offered fall semester. **Classification:** Inconclusive **Action:** 1 - No Action Required 09/15/2010 - 94% of students earned 75% or higher **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 215 - Nuclear Medicine Imaging 1 - Communication - Identify methods to communicate with a diverse population (Created By Z - NUCM Courses) **Start Date:** 12/14/2009 **Course Outcome Status:** Active	**Assessment Method:** Students act out various patient populations (gender, race, various disabilites) while each student acts as a technologist filling out a patient questionnaire and employing various communication efforts. **Assessment Method Category:** Project/Model/Invention **Criterion for Success:** 90% will receive 75% or higher on the assignment	12/14/2012 - 32 of 32, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required 12/16/2011 - 45 of 45, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required 01/19/2011 - 41/41 (100%) **Classification:** Criterion Met **Action:** 1 - No Action Required 09/17/2010 - 100% of students earned 75% or higher **Classification:** Criterion Met **Action:**	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
		1 - No Action Required	
Z - NUCM Courses - NUCM 215 - Nuclear Medicine Imaging 1 - Knowledge & Professional Competency - Differentiate between various radionuclide therapies and their radiopharmaceuticals (Created By Z - NUCM Courses) **Start Date:** 12/14/2009 **Course Outcome Status:** Active	**Assessment Method:** Students create a PowerPoint presentation about a specific radionuclide therapy and present to the class. (Rubric) **Assessment Method Category:** Presentation(Oral) **Criterion for Success:** 90% will receive 75% or higher on the PowerPoint presentation by the instructor	12/14/2012 - 31 of 32, 97% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		12/16/2011 - 45 of 45, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		01/19/2011 - 1/41 (100%) **Classification:** Criterion Met **Action:** 1 - No Action Required	
		09/17/2010 - 100% of students earned 75% or higher **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 216 - Nuclear Med Imaging 1 Lab - Knowledge & Professional Competency 1 - Demonstrate the skills necessary to ensure patient safety, preparation of radiopharmaceuticals and quality control, therapy techniques and various protocols (Created By Z - NUCM Courses) **Start Date:** 12/14/2009 **Course Outcome Status:** Active	**Assessment Method:** Students participate in thyroid therapy laboratory **Assessment Method Category:** Case Studies/Problem-based Assignments **Criterion for Success:** 90% will receive 75% or higher on the thyroid therapy laboratory session	12/14/2012 - 32 of 32, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		12/16/2011 - 44 of 44, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		01/19/2011 - 41/41 (100%) **Classification:** Criterion Met **Action:**	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
		1 - No Action Required	
		09/17/2010 - 100% of students earned 75% or higher **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 216 - Nuclear Med Imaging 1 Lab - Knowledge & Professional Competency 2 - Prepare radiopharmaceuticals used in Nuclear Medicine Technology and identify and perform quality control on radiopharmaceutical kits (Created By Z - NUCM Courses) **Start Date:** 12/14/2009 **Course Outcome Status:** Active	**Assessment Method:** Students prepare a radiopharmaceutical kit and perform quality control methods on the kit **Assessment Method Category:** Case Studies/Problem-based Assignments **Criterion for Success:** 90% will receive 75% or higher on laboratory practical	12/14/2012 - 25 of 32, 78% **Classification:** Criterion Not Met **Action:** 1 - No Action Required	
		12/16/2011 - 40 of 44, 91% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		01/19/2011 - 40/41 (98%) **Classification:** Criterion Met **Action:** 1 - No Action Required	
		09/17/2010 - 100% of students earned 75% or higher **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 240 - Cross Sectional Imaging - Knowledge & Professional Competency - Identifies the various anatomic structures within cross sectional images of the human body. (Created By Z - NUCM Courses) **Start Date:** 12/15/2009	**Assessment Method:** Students will be given a 100 question final exam in which anatomic structures are identified **Assessment Method Category:** Test - Internally Developed - Pre/Post or Post **Criterion for Success:** 90% of the students will earn 75% or higher	08/08/2012 - 35 of 36, 97% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		08/10/2011 - 43 of 45, 96% **Classification:** Criterion Met	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
Course Outcome Status: Active		**Action:** 1 - No Action Required	
		01/19/2011 - Not offered fall semester. **Classification:** Inconclusive **Action:** 1 - No Action Required	
		09/15/2010 - 98% of students earned 75% or higher **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 240 - Cross Sectional Imaging - Communication - Demonstrates the ability to create a case study and present it to their peers. (Created By Z - NUCM Courses) **Start Date:** 12/15/2009 **Course Outcome Status:** Active	**Assessment Method:** Students create a case study in which a minimum of two diagnostic cross sectional imaging modalities are highlighted. The case study is presented to their peers in a 3-5 minute time frame. (rubric) **Assessment Method Category:** Case Studies/Problem-based Assignments **Criterion for Success:** 90% of the students will earn 75% or higher	08/08/2012 - 35 of 36, 97% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		08/10/2011 - 45 of 45, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		01/19/2011 - Not offered fall semester. **Classification:** Inconclusive **Action:** 1 - No Action Required	
		09/15/2010 - 98% of students earned 75% or higher **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 320 - Nuclear Medicine Imaging 2 - Knowledge &	**Assessment Method:** Essay questions 1-3 describing various	05/10/2013 - 51 of 54, 94% **Classification:**	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
Professional Competency 1 - Identify preparation techniques for various Nuclear Medicine procedures including indications and contraindications. (Created By Z - NUCM Courses) **Start Date:** 12/15/2009 **Course Outcome Status:** Active	imaging procedures and indications for procedures **Assessment Method Category:** Test - Internally Developed - Pre/Post or Post **Criterion for Success:** 90% of the students will earn 75% or higher	Criterion Met **Action:** 1 - No Action Required	
		05/04/2012 - 65 of 75, 87% **Classification:** Criterion Not Met **Action:** 1 - No Action Required	
		05/06/2011 - 54 of 70, 77% **Classification:** Criterion Not Met **Action:** 1 - No Action Required	
		01/19/2011 - Not offered fall semester. **Classification:** Inconclusive **Action:** 1 - No Action Required	
		09/15/2010 - 88% of students earned 75% or higher **Classification:** Criterion Not Met **Action:** 2 - Pending Action	
Z - NUCM Courses - NUCM 320 - Nuclear Medicine Imaging 2 - Knowledge & Professional Competency 2 - Interpret images as normal versus abnormal (Created By Z - NUCM Courses) **Start Date:** 12/15/2009 **Course Outcome Status:** Active	**Assessment Method:** Students are assessed on various nuclear medicine images, including normal and abnormal results **Assessment Method Category:** Test - Internally Developed - Pre/Post or Post **Criterion for Success:** 90% of students will earn 75% or higher	05/10/2013 - 37 of 43, 86% **Classification:** Criterion Not Met **Action:** 1 - No Action Required	
		05/04/2012 - 52 of 60, 87% **Classification:** Criterion Not Met **Action:** 1 - No Action Required	
		05/06/2011 - 53 of 55, 96% **Classification:** Criterion Met **Action:**	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
		1 - No Action Required	
		01/19/2011 - Not offered fall semester. **Classification:** Inconclusive **Action:** 1 - No Action Required	
		09/15/2010 - 85% of students earned 75% or higher **Classification:** Criterion Not Met **Action:** 2 - Pending Action	
Z - NUCM Courses - NUCM 321 - Nuclear Med Imaging 2 Lab - Knowledge & Professional Competency - Demonstrate proficiency in a variety of routine Nuclear Medicine procedures (Created By Z - NUCM **Start Date:** 12/15/2009 **Course Outcome Status:** Active	**Assessment Method:** Students participate in various laboratory activites performing "mock nuclear medicine exams" throughout the semester **Assessment Method Category:** Observations (e.g. Clinical or Field) **Criterion for Success:** 90% of the students will earn 75% or higher	05/10/2013 - 163 of 164, 99% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		05/04/2012 - 225 of 225, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		05/06/2011 - 221 of 221, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		09/15/2010 - 100% of students earned 75% or higher **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 321 - Nuclear Med Imaging 2 Lab - Critical Thinking - To provide the skills necessary to interpret	**Assessment Method:** Students demonstrate proficiency in computer processing portion *question 1) of	05/10/2013 - 40 of 43, 93% **Classification:** Criterion Met	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
images on a comuter in order to evluate the quality of the procedure (Created By Z - NUCM Courses) **Start Date:** 12/15/2009 **Course Outcome Status:** Active	laboratory practical **Assessment Method Category:** Observations (e.g. Clinical or Field) **Criterion for Success:** 90% of the students will earn 75% or higher	**Action:** 1 - No Action Required	
		05/04/2012 - 24 of 39, 62% **Classification:** Criterion Not Met **Action:** 1 - No Action Required	
		05/06/2011 - 24 of 39, 62% **Classification:** Criterion Not Met **Action:** 1 - No Action Required	
		09/15/2010 - 85% of students earned 75% or higher **Classification:** Criterion Not Met **Action:** 2 - Pending Action	
Z - NUCM Courses - NUCM 340 - Advanced Imaging Techniques - Critical Thinking - Discuss enhancement techniques used in Nuclear Medicine Technology (Created By Z - NUCM Courses) **Start Date:** 12/15/2009 **Course Outcome Status:** Active	**Assessment Method:** Students participate in active discussions regarding contrasting and comparing advanced imaging techniques and clinical applications. **Assessment Method Category:** Case Studies/Problem-based Assignments **Criterion for Success:** 90% of the students will earn 75% or higher	08/08/2012 - 50 of 51, 98% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		08/10/2011 - 45 of 47, 96% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		09/15/2010 - 93% of students earned 75 or higher **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 340 - Advanced Imaging Techniques - Knowledge & Professional Competency - Discuss	**Assessment Method:** Students will write a synopsis paper of overall learning of course content	08/08/2012 - 51 of 51, 100% **Classification:** Criterion Met	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
enhancement techniques used in Nuclear Medicine Technology (Created By Z - NUCM Courses) **Start Date:** 12/15/2009 **Course Outcome Status:** Active	**Assessment Method Category:** Written Product (essay, research paper, journal, newsletter, etc.) **Criterion for Success:** 90% of the students will earn 75% or higher	**Action:** 1 - No Action Required 08/10/2011 - 45 of 47, 96% **Classification:** Criterion Met **Action:** 1 - No Action Required 09/15/2010 - 100% of students earned 75% or higher **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 350 - Advanced Nuclear Cardiology - Knowledge & Professional Competency 1 - Demonstrate knowledge required to perform advanced nuclear cardiology procedures per protocol. (Created By Z - NUCM Courses) **Start Date:** 12/15/2009 **Course Outcome Status:** Active	**Assessment Method:** Students participate in active discussions regarding advanced cardiac imaging procedures and their clinical applications. **Assessment Method Category:** Case Studies/Problem-based Assignments **Criterion for Success:** 90% of the students will earn 75% or higher	08/08/2012 - 85 of 90, 94% **Classification:** Criterion Met **Action:** 1 - No Action Required 08/10/2011 - 40 of 41, 98% **Classification:** Criterion Met **Action:** 1 - No Action Required 09/15/2010 - 94% of students earned 75% or higher **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 350 - Advanced Nuclear Cardiology - Knowledge & Professional Competency 2 - Demonstrate knowledge required to perform advanced neclear cardiology procedures per protocol (Created By Z - NUCM Courses) **Start Date:** 12/15/2009	**Assessment Method:** Students discuss various cardiac imaging protocols in essay format on tests 1 & 2 (2 questions per test). **Assessment Method Category:** Test - Internally Developed - Pre/Post or Post **Criterion for Success:**	08/08/2012 - 58 of 60, 97% **Classification:** Criterion Met **Action:** 1 - No Action Required 08/10/2011 - 54 of 57, 95% **Classification:**	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
Course Outcome Status: Active	90% of the students will earn 75% or higher	Criterion Met **Action:** 1 - No Action Required	
		09/15/2010 - 84% of students earned 75% or higher **Classification:** Criterion Not Met **Action:** 2 - Pending Action	
Z - NUCM Courses - NUCM 351 - Adv Nuclear Cardiology Lab - Knowledge & Professional Competency - Demonstrates ability to interpret electrocardiograms (Created By Z - NUCM Courses) **Start Date:** 12/15/2009 **Course Outcome Status:** Active	**Assessment Method:** Students participate in an online tutorial which includes a series of quizzes for assessment. **Assessment Method Category:** Test - Internally Developed - Pre/Post or Post **Criterion for Success:** 90% of the students will earn 7 points or higher	08/08/2012 - 45 of 45, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		08/10/2011 - 41 of 41, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		09/15/2010 - 100% of students earned 7 points or higher **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 351 - Adv Nuclear Cardiology Lab - Critical Thinking - Demonstrates ability to respond to a cardiac emergency situation (Created By Z - NUCM Courses) **Start Date:** 12/15/2009 **Course Outcome Status:** Active	**Assessment Method:** Students participate in a simulated cardiac emergency situation. Students are assessed in their ability to respond appropriately to the situation and their demonstrated skills. **Assessment Method Category:** Case Studies/Problem-based Assignments **Criterion for Success:** 90% of the students will earn 75% or higher	06/20/2013 - 41 of 41, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		08/08/2012 - 45 of 45, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
		09/15/2010 - 100% of students earned 75% or higher **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 360 - Management-Leadership in NMT - Knowledge & Professional Competency - Demonstrate knowledge regarding management and leadership techniques as they apply to Nuclear Medicine Technology (Created By Z - NUCM Courses) **Start Date:** 12/15/2009 **Course Outcome Status:** Active	**Assessment Method:** Students write a paper describing management and leadership techniques as they apply to Nuclear Medicine Technology. **Assessment Method Category:** Written Product (essay, research paper, journal, newsletter, etc.) **Criterion for Success:** 90% of students will earn 75% or higher	08/08/2012 - 44 of 45, 98% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		08/10/2011 - 25 of 25, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		09/15/2010 - 100% of students earned 75% or higher **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 360 - Management-Leadership in NMT - Communication - To provide the information regarding management and leadership skills as they apply to Nuclear Medicine Technology (Created By Z - NUCM Courses) **Start Date:** 09/15/2010 **Course Outcome Status:** Active	**Assessment Method:** Students participate in active discussions regarding their applications in the healthcare setting. **Assessment Method Category:** Written Product (essay, research paper, journal, newsletter, etc.) **Criterion for Success:** 90% of the students will earn 75% or higher	08/08/2012 - 43 of 45, 96% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		08/10/2011 - 25 of 25, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		09/15/2010 - 96% of students earned 75% or higher **Classification:** Criterion Met	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
		Action: 1 - No Action Required	
Z - NUCM Courses - NUCM 360 - Management-Leadership in NMT - Professional & Ethical Behavior - Demonstrates the ability to apply management and leadership skills with various personality types (Created By Z - NUCM Courses) **Start Date:** 12/15/2009 **Course Outcome Status:** Active	**Assessment Method:** Students complete a general personality profile and analyze the challenges that may exist between themselves and others of alternate personality types **Assessment Method Category:** Written Product (essay, research paper, journal, newsletter, etc.) **Criterion for Success:** 90% of students will earn 75% or higher	08/08/2012 - 45 of 45, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		08/10/2011 - 25 of 25, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		09/15/2010 - 97% of students earned 75% or higher **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 380 - Diagnostic Imaging Techniques - Communication - Demonstrates the ability to analyze and differentiate with insight and depth the various types of advanced imaging systems utilized in Nuclear Medicine Technology (Created By Z - NUCM Courses) **Start Date:** 12/15/2009 **Course Outcome Status:** Active	**Assessment Method:** Students participate in online discussion topics regarding advanced imaging systems instigated by the instructor. Students must cite references during the discussions. **Assessment Method Category:** Case Studies/Problem-based Assignments **Criterion for Success:** 90% of students will earn 75% or higher	09/15/2010 - 100% of students earned 75% or higher **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 380 - Diagnostic Imaging Techniques - Knowledge & Professional Competency - Demonstrates knowledge of procedures acquired on advanced imaging systems (Created By Z - NUCM Courses) **Start Date:**	**Assessment Method:** Students prepare a PowerPoint presentation on a procedure acquired on an advanced imaging system **Assessment Method Category:** Presentation(Oral) **Criterion for Success:**	09/15/2010 - 100% of students earned 75% or higher **Classification:** Criterion Met **Action:** 1 - No Action Required	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
12/15/2009 **Course Outcome Status:** Active	90% of the students will earn 75% or higher		
Z - NUCM Courses - NUCM 480 - Research Methodology - Research & Evidence-Based Practie - Proposes an area of need within the field of Nuclear Medicine Technology in which to research during NUCM 499, Capstone in NM (Created By Z - NUCM Courses) **Start Date:** 12/15/2010 **Course Outcome Status:** Active	**Assessment Method:** Students will write a proposal for a research project that will be performed in NUCM 499, Capstone in NMT. (rubric) **Assessment Method Category:** Written Product (essay, research paper, journal, newsletter, etc.) **Criterion for Success:** 90% will receive 75% or higher on the proposal paper	12/14/2012 - 78 of 78, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required 12/16/2011 - 48 of 52, 92% **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 480 - Research Methodology - Communication and Knowledge & Professional Competency - Evaluate the impact of research on the profession of Nuclear Medicine Technology (Created By Z - NUCM Courses) **Start Date:** 12/15/2010 **Course Outcome Status:** Active	**Assessment Method:** Students will create a PowerPoint presentation describe the impact of research on the profession of Nuclear Medicine Technology. (rubric) **Assessment Method Category:** Presentation(Oral) **Criterion for Success:** 90% will receive 75% or higher on the PowerPoint presentation	12/14/2012 - 78 of 78, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required 12/16/2011 - 52 of 52, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 493 - Clinical Application in NMT 1 - Knowledge & Professional Competency - To provide students with the skills necessary to enter the profession as an entry level nuclear medicine technologist. (Created By Z - NUCM Courses) **Start Date:** 12/15/2009 **Course Outcome Status:** Active	**Assessment Method:** Students are required to master 15 clinical evaluations. **Assessment Method Category:** Internship Evaluation **Criterion for Success:** 100% of students will master the set number of clinical evaluations.	12/14/2012 - 42 of 42, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required 12/16/2011 - 40 of 40, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
Z - NUCM Courses - NUCM 494 - Clinical Application in NMT 2 - Knowledge & Professional Competency - To provide students with the skills necessary to enter the profession as an entry level nuclear medicine technologist. (Created By Z - NUCM Courses) **Start Date:** 12/15/2009 **Course Outcome Status:** Active	**Assessment Method:** Students are required to master 17 clinical evaluations. **Assessment Method Category:** Internship Evaluation **Criterion for Success:** 100% of students will master the set number of clinical evaluations.	05/10/2013 - 41 of 41, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required 05/04/2012 - 41 of 41, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required 05/06/2011 - 31 of 31, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 499 - Capstone for NMT - Communication - Demonstrates the ability to prenset information regarding the field of Nuclear Medicine Technology to other healthcare professionals (Created By Z - NUCM Courses) **Start Date:** 05/19/2011 **Course Outcome Status:** Active	**Assessment Method:** Students create a PowerPoint presentation to educate healthcare professionals about Nuclear Medicine Technology **Assessment Method Category:** Presentation(Oral) **Criterion for Success:** 90% will receive 75% or higher on the PowerPoint presentation	05/10/2013 - 49 of 49, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required 05/04/2012 - 46 of 46, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required 05/06/2011 - 39 of 39, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - NUCM Courses - NUCM 499 - Capstone for NMT - Research & Evidence-Based Practice - Demonstrates the ability to identify an area of need within the Nuclear Medicine department and approach it from an	**Assessment Method:** Students plan and implement a research project from an evidence-based perspective. (rubric) **Assessment Method Category:**	05/10/2013 - 49 of 49, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
evidence-based perspective (Created By Z - NUCM Courses) **Start Date:** 05/19/2011 **Course Outcome Status:** Active	Written Product (essay, research paper, journal, newsletter, etc.) **Criterion for Success:** 90% will receive 75% or higher on the research paper	05/04/2012 - 46 of 46, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required 05/06/2011 - 39 of 39, 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	

Appendix D: Program Level Assessment

**Unit Assessment Report - Four Column

Ferris State University

Program - Nuclear Medicine (B.S.)

Mission Statement: Building upon the mission, vision and values of the College of Allied Health Sciences the Nuclear Medicine Technology Program prepares highly qualified and competent professionals for successful and rewarding careers as Nuclear Medicine Technologists

Advisory Board/Committee Meetings: Twice per year

Next FSU Academic Program Review: 2013-2014

Accreditor Body: Joint Review committee on Educational Programs in Nuclear Medicine Technology (JRCNMT)

Accreditor Body - Academic Year of Next Review: 2013-2014

College: CAHS

Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
Program - Nuclear Medicine (B.S.) - Graduates will communicate effectively as a member of an interdisciplinary health care team. - CAHS Category: Communication **Outcome Types:** Learning **Outcome Status:** Active	**Assessment Method:** Adjunct clinical instructor performance evaluation in the clinical setting. **Assessment Method Category:** Observations (e.g. Clinical or Field) **Criterion for Success:** 90% of students will be rated at a score of "Agree" or higher on the communication components of the behavioral trait form for clinical performance in NUCM 493 and NUCM 494.	08/12/2013 - ACI's rated 100% of 2012 graduates "Agree" or higher on the communication components of the behavioral trait form for clinical performance in NUCM 493 and NUCM 494. **Classification:** Criterion Met **Action:** 1 - No Action Required	
	Assessment Method: Affective questions on the employer survey. **Assessment Method Category:** Survey - Employer **Criterion for Success:** 90% of graduates will be rated by their employer as average or above when compared to other NMT graduates.	08/12/2013 - Employer/ACI rated 100% of graduates average or above when compared to other NMT graduates. **Classification:** Criterion Met **Action:** 1 - No Action Required	
	Assessment Method: Communication skill questions on Graduate Exit Survey.	08/12/2013 - Communication skill preparation was not specifically addressed on 2013 graduate survey.	08/12/2013 - Revise graduate exit survey.

Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
	Assessment Method Category: Survey - Graduate (Current Year) **Criterion for Success:** 90% of graduates will rate the program average or above average in communication skill preparation.	**Classification:** Inconclusive **Action:** 2 - Pending Action **Change Assessment Strategy:** Yes	
Program - Nuclear Medicine (B.S.) - Graduates will engage in lifelong learning & promotion of profession in a legal, ethical and professional manner. - CAHS Category: Ethical, Legal and Professional **Outcome Types:** Learning **Outcome Status:** Active	**Assessment Method:** Professional Development Activities. **Assessment Method Category:** Survey - Alumni (after one year) **Criterion for Success:** 90% of graduates will report that they meet the continuing education requirements for registration and/or certification.	08/12/2013 - Questioned not addressed on alumni survey or by specialized accreditation during 2013 site visit. **Classification:** Inconclusive **Action:** 2 - Pending Action **Change Assessment Strategy:** Yes	08/12/2013 - Reevalaute assessment strategy and/or Alumni survey.
	Assessment Method: Professional Involvement Roles **Assessment Method Category:** Survey - Alumni (after one year) **Criterion for Success:** 50% of graduates report that they hold membership in the professional organization.	08/12/2013 - Questioned not addressed on alumni survey or by specialized accreditation during 2013 site visit. **Classification:** Inconclusive **Action:** 2 - Pending Action **Change Assessment Strategy:** Yes	08/12/2013 - Reevalaute assessment strategy and/or Alumni survey.
Program - Nuclear Medicine (B.S.) - Graduates will become credentialed as a Registered and/or Certified Nuclear Medicine Technologist. - CAHS Category: Knowledge and Technical Competencies **Outcome Types:** Learning **Outcome Status:** Active	**Assessment Method:** Nuclear Medicine Technology Certification Board(NMTCB) and/or American Registry of Radiologic Technologists(ARRT)(N). **Assessment Method Category:** Certification Exam **Criterion for Success:** 80% of graduates will pass the NMTCB and/or ARRT exam within 1 year of graduation.	03/27/2013 - 98% of 2012 Graduates passed the NMTCB Exam on the first attempt. **Classification:** Criterion Met **Action:** 1 - No Action Required	
		01/15/2012 - 94% of 2011 Graduates passed the NMTCB Exam on the first attempt. **Classification:** Criterion Met **Action:**	

Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
		1 - No Action Required	
		01/15/2011 - 83% of 2010 Graduates passed the NMTCB Exam on the first attempt. **Classification:** Criterion Met **Action:** 1 - No Action Required	
		09/16/2010 - 85% of 2009 Graduates passed the NMTCB Exam on the first attempt. **Classification:** Criterion Met **Action:** 1 - No Action Required	
		06/19/2009 - 83% of the 2007 graduates passed the NMTCB certification exam within 1 year of graduation. **Classification:** Criterion Met **Action:** 1 - No Action Required	
	Assessment Method: Cognitive and psychomotor questions. **Assessment Method Category:** Survey - Employer **Criterion for Success:** 80% of graduates will be rated average or above by their employers.	08/12/2013 - 100% of 2012 graduates were rated average or above by their employers/ACI's. **Classification:** Criterion Met **Action:** 1 - No Action Required	
	Assessment Method: Cognitive and psychomotor skill assessment. **Assessment Method Category:** Survey - Alumni (after one year) **Criterion for Success:** 80% of graduates will rate the program average or above in skill preparation.	08/12/2013 - 100% of 2012 alumni rated the program average or above for skill preparation. **Classification:** Criterion Met **Action:** 1 - No Action Required	
	Assessment Method: Cognitive and psychomotor skills assessment. **Assessment Method Category:**	08/12/2013 - 89% of 2013 graduates rated the program average or above in skill preparation. **Classification:** Criterion Met	

Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
	Survey - Graduate (Current Year) **Criterion for Success:** 80% of graduates will rate the program average or above in skill preparation.	**Action:** 1 - No Action Required	
Program - Nuclear Medicine (B.S.) - The program will meet the essentials of the JRCNMT to maintain specialized accreditation. - CAHS Categories: Specialized Accreditation **Outcome Types:** Other **Outcome Status:** Active	**Assessment Method:** Nuclear Medicine Technology Certification Board(NMTCB) and/or American Registry of Radiologic Technologists(ARRT)(N). **Assessment Method Category:** Certification Exam **Criterion for Success:** 80% of graduates will pass the NMTCB and/or ARRT exam within 1 year of graduation.	09/16/2010 - 85% of 2009 Graduates passed the NMTCB Exam on the first attempt. **Classification:** Criterion Met **Action:** 1 - No Action Required	
		06/18/2009 - 83 % of the 2007 graduates passed the NMTCB certification exam within 1 year of graduation. **Classification:** Criterion Met **Action:** 1 - No Action Required	
	Assessment Method: Analysis of attrition data produced by FSU **Assessment Method Category:** Data Analysis **Criterion for Success:** The program will report an attrition rate of less than 10% .	05/20/2012 - Attrition rate for 2012 graduating class was 26%. **Classification:** Criterion Not Met **Action:** 2 - Pending Action	
		05/20/2011 - Attrition rate for 2011 graduates is 24%. **Classification:** Criterion Not Met **Action:** 2 - Pending Action	
		06/19/2009 - The program attrition rate for 2007-2008 was 7.5%. **Classification:** Criterion Met **Action:** 1 - No Action Required	

Appendix E: Curriculum Map

Program - Nuclear Medicine (B.S.) - Curriculum Map

Legend: (A) - Program Assessment, (I) - Introduced, (M) - Mastery, (R) - Reinforced

Outcomes	CCHS 101	CCHS 102	CCHS 315	HCSA 335	MRIS 102	NUCM 100	NUCM 101	NUCM 110	NUCM 111	NUCM 205	NUCM 206	NUCM 215	NUCM 240	NUCM 320	NUCM 321	NUCM 340	NUCM 350	NUCM 351	NUCM 360	NUCM 380	NUCM 480	NUCM 491	NUCM 492	NUCM 493	NUCM 499
Graduates will communicate effectively as a member of an interdisciplinary health care team.	I	I		R		I		R	R		R				R			R	R			R	M		A, M
Graduates will engage in lifelong learning & promotion of profession in a legal, ethical and professional manner.	I	I				I													R			M	M		M
Graduates will become credentialed as a Registered and/or Certified Nuclear Medicine Technologist.						I		I		I, R		R		R		R	R		R	R		R	R		A
The program will meet the essentials of the JRCNMT to maintain specialized accredit						I	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	A, R	A, R		A, M

Outcomes	CCHS 101	CCHS 102	CCHS 315	HCSA 335	MRIS 102	NUCM 100	NUCM 101	NUCM 110	NUCM 111	NUCM 205	NUCM 206	NUCM 215	NUCM 240	NUCM 320	NUCM 321	NUCM 340	NUCM 350	NUCM 351	NUCM 360	NUCM 380	NUCM 480	NUCM 491	NUCM 492	NUCM 493	NUCM 499
ation.						I	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	A, R	A, R		A, M

Appendix F: JRC NMT Response July 2013

JOINT REVIEW COMMITTEE
ON EDUCATIONAL PROGRAMS
IN NUCLEAR MEDICINE TECHNOLOGY
2000 W. Danforth Rd., Ste. 130, #203
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July 30, 2013

Tim VanderLaan, MPA, CNMT
Nuclear Medicine Technology Program
Ferris State University - Grand Rapids
151 Fountain Street NE
Grand Rapids, MI 49503

Dear Mr. VanderLaan:

The Joint Review Committee on Educational Programs in Nuclear Medicine Technology (JRCNMT) received the report of the site evaluators who visited the nuclear medicine technology program sponsored by Ferris State University. The following preliminary report is provided for your information and review.

If a deficiency in compliance with a *Standard* has been cited below and you believe the review team made a factual error in citing the deficiency you are encouraged to write to the JRCNMT. Comments or information received on or before **August 28, 2013** will be submitted to both the review team and the full Board. Comments regarding factual accuracy should apply to the findings as they related to the program at the time of the site visit. They should not include changes implemented as a result of the evaluation or this letter.

Review of the self-study and site visit report noted the following:

Program Strengths

1. Excellent administrative and financial support, as evidenced by exceptional teaching laboratory resources.
2. Dedicated and enthusiastic Program Director and Clinical Coordinator.
3. Excellent clinical affiliates and clinical supervisors.

Suggestions to Enhance Program Effectiveness

1. Continue to monitor and improve clinical experiences in nuclear pharmacy, therapy procedures and PET/CT.
2. On-going monitoring is necessary to ensure program uniformity between Big Rapids and Grand Rapids campuses.
3. To ensure continued equitability of student clinical education assignments, on-going monitoring is needed.
4. Continue to monitor and, when indicated, improve the program outcomes data collection and analysis process.

Possible Deficiencies in Compliance with the *Standards*

C2.1c Postsecondary educational content for the nuclear medicine technologist shall include general physics as a prerequisite.

The program requires a general physics course but it is not prerequisite to the radiation and nuclear medicine physics content in the program.

F1.3 The program must submit an application for all clinical affiliates.

The program has been assigning students to PET/CT facilities that have not been reviewed and recognized by the JRCNMT.

Accreditation would be based on the condition that the maximum capacity of **51 students** would not be exceeded in the clinical phase of the program. The approved student capacity for each clinical affiliate is identified below. The capacity is based on current staffing levels and volume of procedures performed. Please note "Arranged (arr)" means students are assigned to the facility for special rotations, but the capacity is not included in the calculation of total clinical student capacity. Where clinical affiliates are shared with other educational programs, it is the responsibility of the program directors to ensure clinical assignments do not exceed the approved capacity at these affiliates.

Affiliate	Location	Student Capacity
Allegiance Health Hospital*	Jackson, MI	2
Alpena Regional Medical Center	Alpena, MI	1
Borgess Medical Center	Kalamazoo, MI	2
Bronson Battle Creek	Battle Creek, MI	2
Bronson Methodist Hospital	Kalamazoo, MI	1
Covenant Healthcare	Saginaw, MI	2
Genesys Regional Medical Center*	Grand Blanc, MI	2
Henry Ford Hospital	Detroit, MI	3
Marquette General Hospital	Marquette, MI	2
McLaren Bay Region	Bay City, MI	3
McLaren Central Michigan	Mount Pleasant, MI	1
McLaren Greater Lansing	Lansing, MI	2
McLaren Macomb	Mount Clemens, MI	2
Memorial Healthcare	Owosso, MI	1
Memorial Medical Center of Western Michigan	Ludington, MI	1
Mercy Hospital Cadillac	Cadillac, MI	1
Mid-Michigan Medical Center	Midland, MI	1
Munson Medical Center	Traverse City, MI	2
Oakwood Hospital & Medical Center	Dearborn, MI	2
Sparrow Health System	Lansing, MI	2
Spectrum Health Blodgett Hospital	Grand Rapids, MI	1
Spectrum Health Butterworth Hospital	Grand Rapids, MI	3
Spectrum Health Gerber Memorial Hospital	Fremont, MI	1
St. Joseph Mercy Hospital - Ann Arbor	Ann Arbor, MI	3
St. Mary's Health Care	Grand Rapids, MI	2
St. Mary's of Michigan	Saginaw, MI	1
University of Michigan Health System*	Ann Arbor, MI	4
VA Ann Arbor Healthcare System*	Ann Arbor, MI	1
	Total program capacity	**51**

*indicates shared affiliate

This is a preliminary letter of findings provided for your input should you feel there are inaccuracies that you wish to address prior to the board's review of the report. Opportunity to undertake and report corrective actions pertaining to deficiencies is provided after the board issues the accreditation action.

The accreditation action on this program will be taken at the November meeting of the JRCNMT Board of Directors. The accreditation action letter will be sent to you and the president of the university within 30 days of the meeting.

Please contact me if you have any questions about the summary report or about your response, should you choose to submit one.

Sincerely,

Jan M. Winn

Jan M. Winn, M.Ed., RT(N), CNMT
Executive Director

cc: Vesper Grantham, MEd, RT(N), CNMT, Chairman
Hung Q. Dam, MD, Vice-Chairman
Leesa Ross, MA, RT(N)(CT), CNMT, PET, Secretary-Treasurer