

# **MASTER OF SCIENCE (M.S.)**

## **INTEGRATED SCIENCE AND TECHNOLOGY**

### **PURPOSE**

The Masters in Integrated Science and Technology (ISAT) is an interdisciplinary program that emphasizes applications of chemistry, computer science, industrial technology, mathematics, and physics in a career enhancement degree. This degree has been devised to meet the specific needs of students attending regional universities and desiring technical employment. This degree will prepare students for the workplace by giving them experience in applying their knowledge of mathematics and science to projects of interest to business and industry. Individuals with experience and training in technology will gain a deeper understanding of the science and mathematics used in their fields. Students will learn these problem-solving skills through a core of interdisciplinary project-oriented courses that will extend and broaden training in each of the academic areas.

**Objectives of the Program:** Students who complete the ISAT degree at Southeastern Louisiana University will be able to:

- Integrate information and concepts across different scientific and technical disciplines.
- Apply specialized knowledge from chemistry, computer science, industrial technology, mathematics or physics to solve problems that are critical to future growth of local business and industry.
- Work effectively with people who possess various educational and experiential backgrounds.
- Use appropriate technology in communication, information and knowledge management, modeling, forecasting, and decision making.

Students in the ISAT program will take a core of interdisciplinary, project-oriented courses that will extend and broaden their training in science and technology. In the course of their studies, these students will learn to use current problem-solving approaches from mathematics, chemistry, physics, computer science and industrial technology to solve problems from a wide variety of business and industrial settings.

### **REQUIREMENTS FOR ADMISSION**

Applicants to the ISAT program must have completed an undergraduate degree program and have earned at least 30 semester hours in any combination of chemistry, computer science, industrial technology, mathematics, or physics to enter the program. Applicants must have a cumulative undergraduate GPA of at least 2.75, and a combined Verbal and Quantitative Score on the Graduate Record Exam of at least 850. In addition to GRE score, applicants must submit a letter of application (two), letters of recommendation and transcripts of previous undergraduate or graduate work.

Students who fail to meet any of the above criteria could still be granted conditional admission into the ISAT program. Conditional admission may be granted with fewer than 30 semester hours in Chemistry, Computer Science, Industrial Technology, Mathematics, and/or Physics. Candidates for conditional admission will have a minimum cumulative grade point average of 2.5 on a 4.0 scale for all undergraduate work attempted or a minimum cumulative grade point average of 3.00 on all upper division undergraduate coursework attempted, and will submit a letter of application (two), letters of recommendation, and transcripts of previous undergraduate and graduate work. Students admitted under conditional status must maintain a minimum cumulative graduate GPA of 3.0 during their first 12 hours to remain in the program.

### **ACADEMIC STANDARDS POLICY**

1. Any student in the ISAT program who earns a grade less than a "C" in any course in the ISAT curriculum or who earns more than one (1) "C" in the curriculum must present a written appeal to the Program Coordinator no later than 10 working days prior to the beginning of the next full semester. An Academic Standards Committee will review these appeals. This appeal should address the student's perception of the reasons for this grade and the reasons why he/she should be allowed to repeat the course and remain in the ISAT program. Failure to submit the written appeal according to the above timelines will be interpreted by the Committee as a declaration that the student does not wish to continue in the program.
2. The Committee will meet with the student and respond to the student's appeal in writing before the beginning of the next full semester.
3. The Committee may invite the instructor(s) of the course and/or any other personnel who may have supervised components of class work to attend the appeal for information purposes. There will be no other counsel present for the discussion.

4. The Committee will make one of the following recommendations to the students and submit a copy to the Dean of the Graduate School.
  - a) The student may repeat the coursework with no ancillary conditions or restraints.
  - b) The student may repeat the coursework but under certain specified conditions  
i.e. restricted course load, tutor or mentor help, etc.
  - c) The student will no longer be allowed to continue in the ISAT program.

## DEGREE REQUIREMENTS

The ISAT degree will require a total of 33 semester hours consisting of 6 hours of applied science seminars, 12 hours from the core courses, 6 hours in their area of concentration, 3 hours in courses that are cross-listed with their area of concentration, and 6 hours of research project or thesis work.

**Proficiencies:** One of the most positive characteristics of the ISAT program is the diversity of the students. So that all students in the program can succeed, there will be provided for the students a web-based review of introductory material in each of calculus, chemistry, computer science, industrial technology, and physics. All students admitted to the program will be asked to demonstrate proficiency in calculus, chemistry, computer science, industrial technology, and physics during their first year in the program. Proficiency will be comparable to the level of knowledge of having passed an introductory undergraduate course or courses in the area.

Core Courses:	Credit Hours
*ISAT 600. Applied Science Seminar, I	3 hours
*ISAT 601. Applied Science Seminar, II	3 hours
 <u>Four</u> of the following five courses:	
*ISAT 615. Technology in Industry and Society	3 hours
*ISAT 625. Applications of Computing in Science and Technology	3 hours
*ISAT 635. Industrial Chemistry	3 hours
*ISAT 645. Modeling for Science and Industry	3 hours
*ISAT 655. Error and Risk Analysis	<u>3 hours</u> 18 hours
 Discipline Specific Courses:	
2 courses in chosen discipline	6 hours
 Electives:	
1 course cross-listed with chosen discipline	<u>3 hours</u> 9 hours
 Thesis/Research Project:	
One of the following:	
*ISAT 770. Thesis or *ISAT 771. Research Project	<u>6 hours</u>
TOTAL	33 hours

**Core Courses:** The core courses meet the dual challenge of broadening and extending training in the individual areas as well as providing experience in applying these individual disciplines to the design and development of products and processes within business and industry. The core courses introduce elements that will pervade the entire program and unify, or connect, the components of the program of study. A unique aspect of the ISAT degree program is the seamless integration of the social context of science and technology throughout the program's curriculum. Students in this program will study all aspects of real systems regardless of their nature, including scientific, technical, social, informational and political characteristics.

**Concentrations:** Students will select as an area of concentration one of Chemistry, Computer Science, Industrial Technology, Mathematics, or Physics. All students are required to complete 6 hours of graduate courses from their area of concentration and 3 hours of courses cross-listed with their area of concentration. In addition, the program requires (18) hours of core courses and 6 hours of thesis or research project, ISAT 770 or 771.

**Thesis/Research Project:** Students are required to complete a thesis or research project that investigates a significant interdisciplinary, applications-oriented topic centered in the area of concentration. The degree program requires a total of 6 hours of credit in either ISAT 770 or ISAT 771. The topic for a thesis or research project is to be chosen at the completion of ISAT 601. The student will be directed by his or her Degree Committee in the choice of topic as well as choosing whether to do a thesis or a research project. The students must register for the departmental Thesis or Research Project courses for each semester the thesis or research project is in progress.

**Degree Committee:** Each candidate for the ISAT degree will have a Degree Committee that will work with the student to select his or her course of study and the project or thesis for the research component of the degree. Each Degree Committee will consist of two faculty members from the student's major area, one faculty member from an area also involved in the degree, and a representative from business or industry. A student's Degree Committee will be selected during the student's first semester in the program. Research project topics will be chosen during the student's first year in the program, but after completion of the Applied Science Seminars. Students deemed to be making insufficient progress toward their degrees will be notified of the problems identified by the committee, and will be given up to one semester to make improvements.