**North Carolina State University**

### Mathematics

**Rationale**:

A logical approach to problem solving is important for successful functioning in society. It is also important that students be able to formulate models, be critical consumers of quantitative information, communicate mathematically and solve problems.

**Objectives for courses in the category of Mathematics:**

Each course in mathematical sciences will provide instruction and guidance that help students to:

1. improve and refine mathematical problem-solving abilities;
2. and develop logical reasoning skills.

**Natural Sciences**

**Rationale:**

The natural sciences pursue basic questions about the workings of the universe, and the richness, variety and interconnectedness of the world around us. Students today are exposed to an increasing volume of information, from a large variety of sources, in diverse and changing formats. Training in the natural sciences is essential to help students develop skills to distinguish between testable and un-testable ideas, recognize scientifically valid tests of theories, and understand how information relates to those tests. By studying the natural sciences, students learn to reason both inductively and deductively, develop and test scientific hypotheses, and understand the value and limitations of scientific studies. The development and application of new technologies require scientifically literate citizens who can understand technological issues and evaluate the role of science in society's debate of those issues.

**Objectives for courses in the category of Natural Sciences:**

Each course in the natural sciences will provide instruction and guidance that help the student to:

1. use the methods and processes of science in testing hypotheses, solving problems and making decisions; and
2. articulate, make inferences from, and apply to problem solving, scientific concepts, principles, laws, and theories.

**Requirement:**

1. Two courses (6 hours) selected from mathematics, statistics, and logic; one must be a mathematics course.
2. Three courses (11 hours) from the natural sciences; two from different basic sciences (biology, chemistry, earth sciences and physics); two of the three courses must have a laboratory.
3. The sixth course (3 hours) must be selected from any of the mathematical science; natural science; or from the science and technology perspective of the science, technology and society courses.

## Humanities and Social Sciences

### Rationale:

The humanities and the social sciences comprise the subjects and disciplines that use various modes of rational inquiry to understand human nature and experience, organization and change in human societies, the nature of the world, and rational inquiry itself. An education in the humanities and social sciences requires reading significant works, gaining an exposure to a variety of methodologies, and learning to apply these in written exposition. An education in the basic humanistic disciplines is a necessary part of being truly educated -- of becoming a citizen with a broad knowledge of human cultures and with well-considered moral, philosophical, aesthetic, and intellectual convictions. Each course in the general humanities category of the General Education Requirements will provide instruction and guidance that help students to:

1. understand and engage in the human experience through the interpretation of human culture and artifacts (this objective must be the central focus of each humanities course); and
2. become aware of the act of interpretation itself as a critical form of knowing in the humanities; and
3. make academic arguments about the human experience using reasons and evidence for supporting those reasons that are appropriate to the humanities.

**Objectives for courses in the category of Literature:**

Each course within the literature category of the General Education Requirements in the Humanities will provide instruction and guidance that help students to:

1. understand and engage in the human experience through the interpretation of literature (this objective must be the central focus of each literature course); and
2. become aware of the act of interpretation itself as a critical form of knowing in the study of literature; and
3. make scholarly arguments about literature using reasons and ways of supporting those reasons that are appropriate to the field of study.

**Objectives for courses in the category of History:**

Each course in the history category of the General Education Requirements will provide instruction and guidance that help students to:

1. understand and engage in the human experience through the interpretation of evidence from the past situated in geotemporal context (this objective must be the central focus of each history course); and
2. become aware of the act of historical interpretation itself, through which historians use varieties of evidence to offer perspectives on the meaning of the past; and
3. make academic arguments about history using reasons and evidence for supporting those reasons that are appropriate to the field of study.

**Objectives for courses in the category of Philosophy**:

Each course in the philosophy category of the General Education Requirements will provide instruction and guidance that help students to:

1. understand and engage in the human experience through the philosophical study of human thought, human values, and the world (this objective must be the central focus of each philosophy course); and
2. become aware of the acts of understanding and engagement itself as critical parts of the study of philosophy; and
3. make philosophical arguments using reasons and ways of supporting those reasons that are appropriate to the field of study.

**Objectives for courses in the category of Religion/Religious Studies:**

Each course in the religion category of the General Education Requirements will provide instruction and guidance that help students to:

1. understand and engage in the human experience through the interpretation of religious cultures and artifacts (this objective must be the central focus of each religion course); and
2. become aware of the act of interpretation itself as a critical form of knowing in the study of religion; and
3. make arguments about religion using reasons and ways of supporting those reasons that are appropriate to the field of study.

**Objectives for courses in the category of Visual and Performing Arts**:

Courses in the visual and performing arts deal with aesthetic, personal, practical, and cultural significance of the fine and applied arts. Each course in the visual and performing arts category of the General Education Requirements will provide instruction and guidance that help students to:

1. deepen their understanding of aesthetic, cultural, and historical dimensions of artistic traditions; and
2. strengthen their ability to interpret and make critical judgments about the arts through the analysis of structure, form, and style of specific works; and
3. strengthen their ability to create, recreate, or evaluate art based upon techniques and standards appropriate to the genre.

**Objectives for courses in the category of Social Sciences:**

Each course in the social science category of the General Education Requirements will provide instruction and guidance that help students to:

1. understand at least one of the following: human behavior, mental processes, organizational processes, or institutional processes; and
2. understand how social scientific methods may be applied to the study of human behavior, mental processes, organizational processes, or institutional processes; and
3. use theories or concepts of the social sciences to understand real-world problems, including the underlying origins of such problems.

### Requirement:

1. One course in the study of literature (3 hours).
2. One course in the study of history, philosophy, or religion, (3 hours).
3. One course in the study of visual and performing arts. Alternatively, this requirement may be fulfilled by a course in the study of history. (3 hours).
4. Two social science courses from different content areas. Content areas available are psychology, economics, politics and government, sociology, anthropology, cultural geography, and linguistics. (6 hours).
5. Two additional courses selected within Humanities and Social Sciences (6 hours).
* These hours could be used to pursue specific interests, to provide additional breadth or develop depth by taking courses focused on a common theme.
* Courses can be selected from among any of the humanities or social sciences course lists. One of them may be from the Humanities and Social Science perspective of the Science, Technology and Society list. •
* Students may, but are not required to, fulfill this requirement by taking a course(s) on the Humanities and Social Sciences Additional List. The chief purpose of the Humanities and Social Sciences Additional List is to indicate courses that may have pre-requisites and may be more advanced than courses on the primary Humanities and Social Science lists.

      6.  Among the courses selected to fulfill the Humanities and Social Sciences requirement at least one must focus on
           a non-English speaking culture.

**Foreign Language Proficiency for Graduation**

### Rationale:

In a sense, languages are keys to the world. The continuous expansion of international relations makes the knowledge of foreign languages increasingly significant. In learning a foreign language and studying its literature and cultures, students acquire a body of knowledge about how humans think, view the world, express themselves, and communicate with one another.

Language learning also expands one's ability to create and discover new meaning in one's own language and culture. Knowledge of the linguistic structures of a second language helps students to understand their own language better. Likewise, an awareness of contrasting cultural concepts sensitizes students to the differences between their own culture and others. Such an awareness has become increasingly important as the communities of the world have become more interconnected and interdependent. The needs of our global society require that more citizens have access to other languages and cultures in order to cooperate in the process of improving the quality of human life.

### Requirement:

Foreign language proficiency at the FL102 level. This can be demonstrated by completing two years of high school study of the same language with the grade of C or better in each of the two years, or a passing grade at the FL102 level, or by placement into the FL201 by examination. Additional requirements have been established by some Colleges and programs.

**Writing, Speaking, and Information Literacy**

### Rationale:

Writing and speaking are powerful ways of understanding ourselves and the world in which we live. It is through writing and speaking that the various disciplines and professions define the knowledge and methodologies that characterize them. And because effective writing and speaking in academic and professional settings often demand proficiency in the use of information technologies and resources, students must have a basic understanding of how information is identified and defined by experts, structured, organized, and accessed, in both the print and digital environments. Mastery of communication arts and information skills is central to engaging in the productive life of academic and professional communities.

**Objectives for courses in the category of Writing, Speaking and Information Literacy:**

Each course in the writing and speaking category of the General Education Requirements will provide instruction and guidance that help students to:

1. communicate effectively in specific writing or speaking situations, which may include various academic, professional, or civic situations; and
2. understand and respond appropriately to the critical elements that shape communication situations, such as audience, purpose, and genre; and
3. critique their own writing or speaking and provide effective and useful feedback to enable other students to improve their writing or speaking; and
4. demonstrate critical and evaluative thinking skills in locating, analyzing, synthesizing, and using information in writing or speaking activities.

### Requirement:

1. One semester of composition and rhetoric during the freshman year.
2. One semester from any of the following:
* advanced writing,
* speech, or
* foreign language (FL\_ 201 or higher in the student's first foreign language or any FL\_ course in a second language).

       3.   In addition, each curriculum is designed so that upper-level courses and other programmatic experiences help
students write and speak competently in the discipline, including the ability to retrieve, evaluate, and manage information in ways that are appropriate to the discipline. In each urriculum, the design and delivery of that support are guided by various forms of programmatic assessment.

**Physical Education**

### Rationale:

The development of attitudes and skills for a healthy life is essential to a university student's education. In addition to developing and gaining an appreciation of health-related fitness and wellness concepts and fundamental motor skills, student participation in physical activities and sport significantly decreases major health risks, reduces stress from the pressures of academic life, and improves general social and mental well-being.

**Objectives for courses in the category of Physical Education:**

Each course in the Physical Education category of the General Education Requirements will provide instruction and guidance that help students to:

1. learn the fundamentals of health-related fitness, encompassing cardio-respiratory and cardiovascular endurance, muscular strength and endurance, muscular flexibility and body composition; and
2. apply knowledge of the fundamentals of health-related fitness toward developing, maintaining, and sustaining an active and healthy lifestyle; and
3. acquire or enhance the basic motor skills and skill-related competencies, concepts, and strategies of physical activities and sport; and
4. gain a thorough working knowledge, appreciation, and understanding of the spirit and rules, history, safety, and etiquette of physical activities and sport.

### Requirement:  (2 credit hours)

1. Two PE courses, one of which must be a Fitness and Wellness course (Fitness and Wellness courses are those found in the PE 100-level series).
2. All courses will be available on an S/U basis.

### Advising Information:

1. All undergraduate students are required to complete two semesters of physical education courses, which must include at least one Fitness and Wellness course (PE 100-level courses), in order to be eligible for a baccalaureate degree.
2. Students who for medical or other reasons, validated by the college dean in consultation with the Department of Physical Education and, when appropriate, the Student Health Service, cannot participate in any particular physical education course(s) shall fulfill the physical education requirements by successfully completing the necessary credit hours for alternate courses as determined by the Department of Physical Education in consultation with the college dean. The alternate courses designated for this purpose are PE 118, PEH 212, PEH 213, PEH 280, PEH 281, PEH 285 and PEH 286.
3. Entering freshmen and new transfer students who do not transfer two physical education credits are required to complete the Fitness and Wellness Requirement (one PE100-level course).
4. All transfer students will be expected to complete the physical education requirements. Credit will be allowed, semester for semester, for physical education taken at another institution, whether or not the other institution allows credit for physical education. Credit for physical education for transfer students shall be determined by the student's college dean in consultation with the Department of Physical Education, if necessary.

\*Additional Information: Department of Physical Education, http://www.ncsu.edu/pe/     (515-3361)

**Science, Technology & Society**

### Rationale:

North Carolina State University, as a land grant university, has a mission that stresses the application of science and technology for the betterment of humankind. It is essential, therefore, that students be exposed to the vital interactions among science, technology, society, and the quality of life.

**Objectives for courses in the category of Science, Technology & Society:**

Courses fulfilling the Science, Technology & Society requirement should have as a central instructional focus the following objectives. To provide sustained, rigorous, and substantive instruction, efforts to meet the GER Science, Technology & Society objectives should be evident across the entire syllabus and be reflected in course lectures, discussion, readings, projects, assignments, etc.

Each course in the Science, Technology & Society category of the GER will provide instruction and guidance that help students to:

1. develop an understanding of the mutual relationships between science or technology and societies, including the effects of or the effects on cultures, values, industries, governments, or other facets of those societies.
2. develop an ability to critically evaluate information regarding these mutual relationships, recognizing that the information may come from a variety of sources and perspectives.

### Requirement:

Courses which satisfy this requirement can be oriented toward science and technology or toward the humanities and social sciences.

1. Students in science and technology curricula should study this topic from a humanities and social sciences perspective.
2. Students with majors in the humanities and social sciences curricula should study this topic from a science and technology perspective.

This course can also partially satisfy either the humanities and social sciences requirement or the mathematical and natural sciences requirement but not both. This requirement can be satisfied by an interdisciplinary course designed to cover both perspectives.

**Technology Fluency**

### Rationale:

Today's graduate must achieve technology fluency appropriate to the needs of his/her discipline, including technologies for problem solving, empirical inquiry and research. Students will demonstrate critical thinking skills, analytical skills, proficiency and ethical use of the technology within the discipline, which includes responding to and readily adapting to change in those technologies.

### Requirement:

Instruction in technologies appropriate to the discipline will be included and assessed within each curriculum.

**Free Electives**

All programs are encouraged to include free electives in their curricula to satisfy their educational objectives. Moreover, students who would like to take courses beyond those required for their degree are encouraged to do so.

Where curricula include free electives, no other limitations should be imposed upon the student's choice of these electives provided the student has satisfied the prerequisites and provided that no elected course should cover material:

1. that is considered remedial;
2. that is at an elementary level after the student has taken comparable material at an advanced level; or
3. that is substantially presented in a course or courses previously taken.

Students are encouraged to use their free electives to explore fields of study different from those required in their curriculum.

Free electives may be taken on a credit-only basis up to a maximum of 12 credit hours.

Types of courses that are frequently selected as free electives include environmental awareness courses, fine arts, introductions to a discipline or technology designed for non-majors, additional humanities and social sciences, and courses that are part of a minor, a second major, or dual degree. Any elective in a curriculum is interpreted as a free elective unless qualifications are specifically listed.

**University of Minnesota**

**Goals of the General Education Requirements**
**I. Intellectual Community:** To foster development of a liberal arts intellectual community through the introduction of intellectual and practical skills and through active student-faculty engagement in course material.

**II. A. College Writing:** To understand the writing process through invention, organization, drafting, revising, and editing; and develop writers who can write about a range of ideas for a variety of readers.

**B. Foreign Language:** To develop some fluency in the skills of speaking, listening, reading, and writing in a second language; and critical insight into another culture.

**C. Mathematical/Symbolic Reasoning:** To strengthen students’ ability to formulate abstractions, construct proofs, and utilize symbols in formal systems.

**D. Artistic Performance:** To introduce an understanding of the creative process through individual performance, and demonstrate skill in such activities as composition, theater, dance, studio art, and music.

**III. A. Historical Perspectives:** To increase students’ understanding of the past, the complexity of human affairs, the ways in which various forces—economic, cultural, religious, political, scientific—influence efforts to control events, and the ways historians verify and interpret their findings.

**B. Human Behavior, Social Processes, and Institutions:** To increase students’ systematic understanding of themselves as functioning humans, their individual similarities to and differences from others, their awareness of the nature and significance of their conscious experience, and the forces that shape their interpersonal attachments and interactions; or to increase students’ understanding of methods of analyzing modern society or some significant legal, political, economic, religious, social, or scientific component of it.

**C. Communication, Language, Literature, and Philosophy:** To expand students’ capacity to understand, analyze, discuss, and evaluate discourse concerning the complexity of the human condition through the study of languages and works of thought and imagination.

**D. Fine Arts:** To develop students’ understanding, analysis, and appreciation of the arts.

**E. Physical and Biological Sciences:** To increase students’ understanding of the structure and dynamics of the physical and biological worlds, and of the scientific method.

**F. The Global Village:** To increase students’ understanding of the growing interdependence among nations, peoples, and the natural world.

**1. Human Diversity:** To increase students’ understanding of individual and group differences (e.g., race, gender, class) and their knowledge of the traditions and values of various groups in the United States.
**2. People and the Environment:** To increase students’ understanding of the interrelatedness of human society and the natural world.
**3. International Perspective:** To increase students’ systematic understanding of national cultures substantially different from those in which they received their prior schooling.
**4. Ethical and Civic Responsibility:** To broaden and develop students’ capacity to question and reflect upon their own and society’s values and critical responsibilities, and to understand forces, such as technology, that cause them to modify these views and often mandate creation of new ways to resolve legal, social, and scientific issues.

**Provision i**
UMM courses designated as appropriate for meeting general education requirements are those which, if passed successfully, demonstrate the student’s competency in a given skill or area.

Students are required to complete a minimum of 60 credits of general education coursework outside the discipline of the major and must meet the requirements listed below. The requirements may be met not only through UMM courses, but also by transfer of credit, examinations for proficiency or credit, assessment of prior learning, individual projects, and other means. For details, students should consult with their advisers.

In some instances the specific general education requirements may be met using fewer than 60 UMM credits. If this occurs, then introductory or advanced elective courses from any discipline outside the major—with the exception of courses in elementary or secondary education, wellness and sport science, or accounting courses in management—may be used to fulfill the remaining credits of the 60-credit general education requirement.

**Note:** The designation following each category below, e.g., "IC," for Intellectual Community, appears at the beginning of the parenthetical information for each course that is appropriate for that category.

**I. Intellectual Community (IC)\*\*—**One two-credit course.

**II. Skills for the Liberal Arts—**One to five courses.\*
These requirements emphasize the development of the intellectual skills, the communication skills, and the framework for learning needed for successful advanced work. Because new students need this foundation early, they are expected to complete many of these requirements during their first and second years.

**A. College Writing (CW)—**One course.\*

**B. Foreign Language (FL)—**Proficiency in a single language other than English at the level equivalent to the first full year of college language study. This requirement can be met in any one of the following ways:
• Successfully completing a beginning language II course
• Achieving an appropriate score on a placement exam
• Passing a special examination, such as AP or CLEP, or
• For non-native speakers of English, successfully petitioning the Scholastic Committee for an exemption.

Placement tests are given by language disciplines to determine the level of proficiency of a student with prior coursework. Students who plan to complete courses in the same language that they studied in high school must take the placement examination and abide by the placement recommendation. If, after an initial exposure to the recommended course, the placement seems inappropriate, they may follow the recommendation of their language instructor as to the proper entry course.

**C. Mathematical/Symbolic Reasoning (M/SR)—**One course.\*

**D. Artistic Performance (ArtP)—**One course.

**III. Expanding Perspectives—**Eight courses of at least two credits each.

* **A. Historical Perspectives (Hist)—**One course.
* **B. Human Behavior, Social Processes, and Institutions (SS)—**One course.
* **C. Communication, Language, Literature, and Philosophy (Hum)**—One course.
* **D. Fine Arts (FA)**—One course.
* **E. Physical and Biological Sciences (Sci—without lab; Sci-L—with lab)—**Two courses, at least one with lab.
* **F. The Global Village—**Two courses, one from each of two areas.
	+ 1. Human Diversity (HDiv)
	+ 2. People and the Environment (Envt)
	+ 3. International Perspective (IP)\*\*\*
	+ 4. Ethical and Civic Responsibility (E/CR)

\* This requirement may be fulfilled through exemption.
\*\* Students who do not successfully complete IC should contact the Scholastic Committee Office (320-589-6011) for information on completing the requirement.
\*\*\* International students should contact the Scholastic Committee Office for an exemption.

**Provisions ii through iv**
**Provision ii—**Goals will be used to match courses to general education requirements (see below).

**Provision iii—**Only courses of two or more credits will satisfy an Expanding Perspectives requirement.

**Provision iv—**A course can satisfy only one of the general education categories.

Each major can provide students with a statement about how a student majoring in that area will formally acquire computing and writing skills. Students should contact their faculty adviser for current information.