Committee Members

Donna B. Hamilton, Chair
Professor of English, College of Arts and Humanities, and Associate Provost for Academic Affairs and Dean for Undergraduate Studies

Elizabeth Beise
Professor of Physics, College of Computer, Mathematical, and Physical Sciences

Janet Chernela
Professor of Anthropology, College of Behavioral and Social Sciences

Michele Dudash
Associate Professor, Department of Biology, College of Chemical and Life Sciences

Kent Norman
Associate Professor, Department of Psychology, College of Behavioral and Social Sciences

Greig Stewart
Executive Director, College Park Scholars Program

Barbara Thorne
Professor of Entomology, College of Chemical and Life Sciences, and Director, University Honors Program

Mari Boor Tonn
Associate Professor, Department of Communication, College of Arts and Humanities

Ex-officio Members

Katherine McAdams
Associate Professor, Philip Merrill College of Journalism, and Associate Dean, Undergraduate Studies

Laura Slavin
Assistant to the Dean, Undergraduate Studies, and Director, CORE Planning and Implementation
Middle States Standard 12, General Education Subcommittee Report

Middle States Standard 12 concerns college-level proficiencies that students acquire through an institution’s general education program. The fundamental elements of this standard, by which the present report is organized, inquire into whether a general education program
- is of sufficient scope to accomplish these proficiencies;
- develops skills and abilities in general education that are applied in the major or studied in depth;
- incorporates the study of values, ethics, and diverse perspectives;
- ensures that graduating students are proficient in oral and written communication, scientific and quantitative reasoning, technological capabilities appropriate to the discipline, and information literacy, which includes critical analysis and reasoning;
- ensures that general education requirements are clearly described in official publications;
- incorporates assessment of general education outcomes into the institution’s overall plan for assessing student learning and whether assessment results are utilized for curricular improvement.

The charge questions for this committee were as follows:

- A first step in understanding the level and quality of the commitment the University of Maryland has made to undergraduate education is to understand the scope of our CORE-General Education curricula. What is the structure of the University’s general education program? How are the knowledge, skills, and abilities expected to be developed in the general education program used in other components of students’ education. Are there any special efforts to relate general education to the majors?

- Our CORE-General Education curriculum categories are not a one-to-one match with the essential elements of an undergraduate education as outlined by Middle States; rather, they reflect categories adopted by the Maryland Higher Education Commission (MHEC). Considering this difference, define how our curricula assure proficiencies in those essential areas, including oral and written communication, scientific and quantitative reasoning, critical analysis and reasoning, technological competency, and information literacy.

- Consistent with the University’s mission, how does the CORE program incorporate the study of values, ethics, diversity, and diverse perspectives? Does this responsibility lie solely in the CORE program, or is it shared with major programs and shared with other academic and co-curricular activities?

- The University has a longstanding procedure in place for assessment of CORE-General Education. Define that process and its results and show how it has changed over time to meet current assessment expectations.
I. The Scope of the CORE-General Education Program

Based on principles established in 1987 and approved by the University Senate in 1988, the University of Maryland’s CORE Liberal Arts and Sciences Studies Program (General Education, www.ugst.umd.edu/core/) has been in effect since May 1990. This curriculum, comprising 43-46 credits, is organized by disciplinary areas and academic level. See Appendix A for Outline of CORE requirements (also at: www.ugst.umd.edu/core/corereq.html).

Fundamental Studies requirements www.ugst.umd.edu/core/elements/FundaSt.html prescribe mathematics and writing classes for all students, and the CORE Distributive Studies categories www.ugst.umd.edu/core/elements/DistrSt.html focus on breadth, including courses in the following categories: Literature; The History or Theory of the Arts; Humanities; Physical Sciences; Life Sciences; Mathematics and Formal Reasoning; Social or Political History; Behavioral and Social Sciences; and Interdisciplinary and Emerging Issues. The CORE Human Cultural Diversity requirement www.ugst.umd.edu/core/elements/Diversity.html gives students the opportunity to examine their ideas and values in the light of various cultural, intellectual, and social contexts. Diversity courses increase knowledge of what constitutes difference and increase students’ ability to learn from and appreciate people, cultures, ideas, and art forms that are often different from those they know best. After reaching 60 credits, students complete the CORE Advanced Studies requirement for two courses taken outside the major at the 300- or 400-level www.ugst.umd.edu/core/elements/AdvanSt.html. Effective fall 2005, the University Senate added Interdisciplinary and Emerging Issues as an optional Distributive Studies category. Courses in the pipeline include the Department of Philosophy’s newly developed Philosophy of the Environment and the University Honors program’s Knowledge Across Disciplines. Creation of the new CORE category recognizes the important contributions of interdisciplinary studies and encourages development of innovative courses and collaborations across the campus. The proposal may be viewed at: http://www.senate.umd.edu/SenateArchives/2003-2004SenateYear/2003-2004Transmittals%20and%20Abstracts/051503041904/02-03-49/Collection%20010906%2020165149.pdf. A slide presentation on the CORE Interdisciplinary and Emerging Issues category may be viewed at: www.ugst.umd.edu/core/IE-UNIV-0531.pdf.

Over the past 15 years, the University has found great value in an education that is broadly based, requiring the same breadth of CORE courses from all students, regardless of major. The CORE program puts into action the University’s conviction that every graduate needs to have basic education in a variety of fields. The CORE program helps us fulfill our goal to provide a quality liberal arts education embedded into a major research university setting.

Managing CORE

Courses are approved for CORE status by the University Senate’s CORE committee, which includes faculty representatives from across the campus and two student representatives. A one-time approval option further enhances CORE processes, providing an accessible mechanism for initial offerings, experimental courses, courses taught by visiting professors, and special study abroad opportunities. Recent approvals include Neuroethology: From Neurons to Behavior; and the study abroad course Belgium and France: Monuments of War, Sites of Peace. Such courses offer students exceptional academic and international experiences and offer the CORE program continual renewal.

Campus initiatives ensure that CORE requirements relate to other academic programs. Many CORE courses fulfill major, departmental, or college requirements, as well as serve as
primary or gateway requirements for majors, including, for majors in Geography, GEOG 201: Geography of Environmental Systems and GEOG 202: The World in Cultural Perspective; for majors in Business and Economics, ECON 200: Principles of Micro-Economics and ECON 201: Principles of Macro-Economics; for majors in Government and Politics, GVPT 100: Principles of Government and Politics and ECON 200; and for majors in Architecture, ARCH 170: Introduction to the Built Environment and PHYS 121: Fundamentals of Physics I. Most minors also build on general education courses. Such interrelationships ensure depth as well as breadth. For students in living-learning communities and learning communities, co-curricular activities further enhance the CORE program. University Honors [www.honors.umd.edu](http://www.honors.umd.edu) and College Park Scholars [www.scholars.umd.edu](http://www.scholars.umd.edu) are the two largest such communities, with approximately 800 new freshmen each year in each program. Each of the 12 programs within College Park Scholars relies on two or more CORE courses as key components in their themed curricula. Other smaller communities include Gemstone [www.gemstone.umd.edu](http://www.gemstone.umd.edu), Markets and Society [www.ltsc.umd.edu/markets.html](http://www.ltsc.umd.edu/markets.html), Media Literacy, Contemporary Moral Issues [www.ltsc.umd.edu/ltsclearningcomms.html](http://www.ltsc.umd.edu/ltsclearningcomms.html), Global Communities [www.globalcommunities.umd.edu](http://www.globalcommunities.umd.edu), and CIVICUS [www.bsos.umd.edu/civicus](http://www.bsos.umd.edu/civicus). The First-Year Learning Communities for incoming students provide yet another set of such experiences [www.ltsc.umd.edu/ltsclearningcomms.html](http://www.ltsc.umd.edu/ltsclearningcomms.html).

Providing courses for approximately 25,000 undergraduate students requires watchful management. In 2004-2005, Maryland offered during the academic year (fall and spring) approximately 92,400 CORE seats. Approximately 80% of departments and programs contribute CORE courses. To ensure availability and distribution of courses, the Provost annually initiates a formal Planning Cycle process for colleges and departments, with commitments for funds in cases where there are shifts in enrollments. Additionally, the Access Committee, comprised of faculty and administrators from across the University, studies enrollment trends and recommends policy to ensure student access to courses.

**Publishing CORE Requirements**

Potential and current University of Maryland students access accurate and comprehensive information about CORE General Education requirements in Chapter 5 of the Undergraduate Catalog and online at [www.umd.edu/catalog](http://www.umd.edu/catalog). Requirements and course listings also are published in the Fall and Spring Schedules of Classes, printed in thousands of copies and distributed at prominent locations on campus and available online at [www.testudo.umd.edu/ScheduleOfClasses.html](http://www.testudo.umd.edu/ScheduleOfClasses.html). The CORE Program website [www.ugst.umd.edu/core](http://www.ugst.umd.edu/core) includes the requirements, course offerings for each category, and additional material on the program.

The CORE Academic Planner and Record Keeper is a publication distributed at initial advising sessions (mandatory for freshmen) and elsewhere. The Planner includes a worksheet for recording courses taken to fulfill the requirements, as well as important CORE information, including web addresses and telephone contacts. Many colleges, departments, and majors provide their own handouts on curriculum plans that show which of their required courses fulfill CORE requirements. This information is also included in 4-year plans at [www.4yearplans.umd.edu](http://www.4yearplans.umd.edu).
UNIV 100 and UNIV 101, the campus second-stage orientation courses, also provide coverage of CORE requirements, as do introductory seminars in the University Honors Program, College Park Scholars, and other special programs.

Transfer policies and information are published in the Undergraduate Catalog in print and online, and are available at www.transferfaqs.umd.edu and at the Transfer Credit Center (TCC) website at www.tce.umd.edu. The Maryland Higher Education Commission (MHEC) provides a Student Guide to Transfer among Maryland Colleges and Universities (www.mhec.state.md.us/preparing/stuguide.asp) which includes transfer information on general education requirements.

The Student Academic Success-Degree Completion Policy, at www.umd.edu/ugst/academicsuccess.html, promotes students’ success and timely completion of degree requirements. Beginning fall 2005, this policy requires students to complete 4-year course plans that are reviewed by the colleges. College advising offices also provide senior audits.

II. Examining CORE for this Report: Student Learning Across Educational Areas

For the purposes of this report, the subcommittee inquired into whether and how Maryland’s general education curriculum assures proficiencies in the areas designated by Middle States. After considering various approaches, the subcommittee decided to focus its attention on what is accomplished in selected high-enrollment, high-impact CORE courses, identified by Maryland’s enrollment management process as courses taken by at least 10% of freshmen or graduates (see Appendices B and C). Toward that end, the subcommittee developed a survey and distributed it to faculty who teach those courses, asking whether and how each of these courses develop proficiencies in each of the areas: diversity, ethics, and values; oral and written communication; quantitative and scientific reasoning; technological competency; and information literacy and critical analysis and reasoning. Given the importance of research to Maryland’s mission, the survey also included a question on student research. In cases where no single course in a CORE category is taken by at least 10% of students, the committee also surveyed a group of courses in those CORE categories which together comprise at least that percentage (see Appendix D). In cases where the committee needed further information, the committee asked for written reports, conducted interviews, and held one-on-one meetings with faculty and program coordinators. While this method gives only a partial view of the accomplishments of the general education program, it does gather information about a group of courses in which the stakes are indeed high, given the number of students they serve, and it does report on educational standards and activities that represent the Maryland undergraduate experience. Appendix E, which includes all the survey responses and the college syntheses, is available upon request.

III. Diversity, Ethics and Values

Maryland’s general education program incorporates and approaches ethics and from a number of perspectives. However, Diversity has its own general education category.

Diversity

The CORE Human Cultural Diversity requirement, approved by the University Senate in 1988, reads: “Each student should be required to take one course that focuses primarily on either
(a) the history, status, treatment, or accomplishments of women or minority groups and subcultures, or (b) non-Western culture.” The CORE Committee later added a third focus area for Diversity courses, “Concepts and implications of diversity” to include proposed courses that dealt with “otherness” or an examination of difference not previously included.

The CORE Program’s Human Cultural Diversity requirement lists 211 approved courses, a longer list than any other CORE category [www.umd.edu/ugst/core/elements/Diversity.html](http://www.umd.edu/ugst/core/elements/Diversity.html). About half of the Diversity courses may be double-counted to meet CORE Distributive Studies requirements; another 80 may be used to fulfill CORE Advanced Studies requirements. Students often take more than the one Diversity course required.

Numerous courses consider issues of gender, race, ethnicity, class, and sexuality in their content. Others expand students’ exposure beyond "Western" content. ARCH 223: History of Non-Western Architecture, exposes students to less-familiar forms of the built environment; in MUET 200: World Popular Musics and Identity, students explore non-western forms of musical expression. Since the beginning, implementation procedures of the CORE program have sought to increase diversity content in CORE courses generally by including questions concerning diversity content on all Distributive Studies proposal forms. Partly as a result, diversity content enriches many non-diversity courses. For example, PSYC 100: Introduction to Psychology, addresses the influence of diverse cultures on the development of cognition, personality, and emotion. Cultural differences in human motivation and the impact of these diverse perspectives are also discussed.

Central to the values espoused by the University of Maryland is its valuing of Diversity, and the CORE program reflects this emphasis. This year, the University approved the “Policy on Diversity in Educational Programs,” articulating an expansion of the institution’s focus on diversity to underscore the benefits of a diverse environment in promoting intellectual discourse and enhancing “the individual and collective experiences of the campus community,” that benefits “. . . the individual, the institution, and the environment in which we function.”

Ethics and Values
In many contexts at the University including the CORE Program, students encounter attitudes, information, and content regarding ethics and values. In addition to substantive coverage of ethical issues and values in most CORE Diversity courses, most of the high-enrollment CORE courses surveyed address the ethical issues and values that are either at the heart of the discipline being studied or that relate to specific topics. Central among these courses are PHIL 100: Introduction to Philosophy and PHIL 140: Contemporary Moral Issues. Other CORE courses with a special focus on ethics/values include such courses as:

- HONR 288L Medical Devices: Applied Ethics and Public Policy, [www.honors.umd.edu/COURSES/0308/288L0308.htm](http://www.honors.umd.edu/COURSES/0308/288L0308.htm);
- JWST 250/PHIL 234 Fundamental Concepts of Judaism; and

Students also consider ethical issues in CORE courses that are not primarily focused on ethics. Examples abound:

- In GVPT 170: American Government, students discuss and debate the notions of justice and fairness on which our political system is founded.
In CCJS 105: Introduction to Criminology, students discuss how such factors as inappropriate use of biological theories, personal bonds, human capital, human agency, and peer influence can either promote or negate pro-social behavior and support or challenge discrimination based on gender, race and socio-economic status.

- In BSCI 106, Principles of Biology II, an underlying ethic is that understanding of the world should be based on respect for evidence and actions should be based on a rational interpretation of their likely consequences.

- In ENGL 101, students are asked to develop an understanding of ethos or credibility, the classical foundation of ethics, and of the ethical decisions made in incorporating the arguments of others in one’s prose.

- In NFSC 100: Elements of Nutrition students learn about the research strategies used in science and how certain types of research are inappropriate and/or contravene the International Declaration of Human Rights. Students also discuss health and nutrition claims made by various companies which market diets and/or dietary supplements.

Upper-level courses in many disciplines focus on ethics. Among such courses are ENCH 475: Ethics in Science and Engineering and JOUR 300: Ethics in Journalism, both of which fulfill CORE Advanced Studies for non-majors. In addition, many of the CORE Capstone courses, an option under CORE Advanced Studies, cover ethics in the professional fields relevant to the majors.

Other Values
The significant place that arts and humanities requirements have within the CORE-General Education program speaks to yet other values to which the University introduces its students. It is through such courses that students learn how different people have represented the meaning and significance of human life and action. Students explore the affective and spiritual dimensions of human experience and knowledge and develop capacities for appreciation and understanding by extending their experience into other cultures and other historical times. These courses foster the taking of the intellectual and creative risks and leaps that are the foundations of innovation and change. Such knowledge and capacities are essential to informed civic engagement in a globalizing culture.

For example, WMST 250: Introduction to Women’s Studies: Women, Art and Culture, values equal access and self empowerment; in MUET 200: World Popular Musics and Identity, students consider how people resist hegemonic and social forces through music; and ENGL 243: Introduction to Poetry, is committed to helping students understand the systems humans use to make meaning, poetry being perhaps the oldest meaning-making system. In ENGL 391: Advanced Composition, students learn through mutual attention and critique to consider views markedly different from their own and identify ways of resolving differences in pursuit of common understanding. MUET 220: Selected Musical Cultures of the World expands on this value by underscoring respect for different cultures and cultural representations.

Academic Honesty
Throughout CORE courses, faculty members give heightened attention to issues of academic honesty to assure that students understand the relevance and importance of the Code of Academic Integrity [www.studenthonorcouncil.umd.edu/code.html](http://www.studenthonorcouncil.umd.edu/code.html) and the Honor Pledge [www.jpo.umd.edu/aca/honorpledge.html](http://www.jpo.umd.edu/aca/honorpledge.html). The Student Honor Council provides a resource for faculty, *Teaching with academic integrity in mind: Questions college faculty members should ask when designing and teaching their courses* [www.studenthonorcouncil.umd.edu/teachingwithintegrity.html](http://www.studenthonorcouncil.umd.edu/teachingwithintegrity.html). The University’s Office of Information Technology has a web presence on Net Ethics [www.nethics.umd.edu/resources/online/ethics.html](http://www.nethics.umd.edu/resources/online/ethics.html). The Maryland Center for Undergraduate Research (MCUR) provides information on Ethics in Research [www.ugresearch.umd.edu/ethics.htm](http://www.ugresearch.umd.edu/ethics.htm).

IV. Written Communication

ENGL 101: Introduction to Writing makes writing a central activity in the CORE curriculum at Maryland right from the start. A course from the ENGL 39X Professional Writing series, taken in the junior or senior year, enhances the skills and practice attained in ENGL 101 and reinforced in many Distributive Studies courses. This structured approach provides students with the writing tools for success in their lower-level course work, followed by more specialized opportunities to hone those skills in upper-level course work. The following sections describe Maryland’s focus on written communication through these requirements and writing activities in other CORE courses.

Fundamental Studies: The Freshman Writing Program

The Freshman Writing Program, administered in the Department of English, offers approximately 165 sections annually of eight versions of its basic course Introduction to Writing [www.english.umd.edu/programs/FreshmanWriting/programs-freshman-writing.html](http://www.english.umd.edu/programs/FreshmanWriting/programs-freshman-writing.html). Over the past decade, the Program has responded to campus initiatives by creating four specialized versions of the basic course for students in first-year learning communities. In all Freshman Writing courses, students learn persuasive, audience-focused writing, using a consistent set of general assignments. Created and custom-published for the Program, the textbook, “Introduction to Academic Writing,” and the corresponding reader, “Perspectives,” are updated annually.

The Freshman Writing Program is staffed primarily by graduate teaching assistants, whom the Director, coordinators, and mentors of the Program closely train, mentor, supervise, and assess. These training and mentoring components include a graduate course, ENGL 611: Approaches to College Composition, which all first-year Teaching Assistants must take prior to teaching in the Program. The Director with assistance of the coordinators and mentors reviews all student evaluations, and first-semester teachers provide a self-assessment of their work that is shared with a mentor. Students may receive additional writing assistance at the University’s Writing Center, which is open to all students [www.english.umd.edu/programs/WritingCenterWebsite/](http://www.english.umd.edu/programs/WritingCenterWebsite/).

The Director and Coordinators of the Freshman Writing Program have assumed leadership roles in statewide composition activities in regular meetings of composition teachers from other schools in the University System of Maryland and in K-16 alignment groups. The Freshman Writing Program has helped to set the standard for college and community college
writing programs throughout the state, while also setting standards for the teaching of writing in Maryland high schools.

Fundamental Studies: The Professional Writing Program

Now 25 years old, Maryland’s Professional Writing Program [www.english.umd.edu/programs/ProfWriting/home.html](http://www.english.umd.edu/programs/ProfWriting/home.html) was one of the original models for upper-level writing courses in general education, and is still one of the most successful programs nationally. In a recent survey of Maryland alumni, two-thirds of respondents rated their experience in Professional Writing as “very important” and one-third as “somewhat important” to their success after graduation.

The Program offers some 185 sections each year of seven courses that meet the CORE upper-level writing requirement, ranging from the generic “Advanced Composition” to specialized writing courses on such topics as Writing About the Arts, Nonfiction Narrative Writing and Editing, Writing Case Studies and Investigative Reports, Writing About the Environment, Science Writing, Writing About Economics, and Writing for Non-Profits. Students must reach junior status before taking one of these courses. The full array of Professional Writing Courses appears at [www.engl-pw.umd.edu/AboutPWP/AboutPWP.htm](http://www.engl-pw.umd.edu/AboutPWP/AboutPWP.htm). By offering this menu of “39x” courses, the Professional Writing Program ensures that the writing curriculum is integrated into a student’s major.

The Professional Writing Program is staffed each semester by an adjunct faculty of 45-50 lecturers. More than half of the faculty has been with the program for more than five years, and more than half hold an advanced degree. More than three-fourths of lecturers are experienced writing professionals with careers and consultancies in organizations in the Washington, D.C. area.

The Director of the Professional Writing Program is a faculty member in the English Department, who is assisted by two faculty coordinators and an associate staff coordinator. Every semester, all instructors attend at least one of several workshops offered on such topics as grading, responding, paper topic selection, and pedagogy. To evaluate faculty, the program administrators read every student evaluation every semester, observe faculty at least once each year, conduct folder reviews of each instructor by analyzing sample graded papers, and require all instructors to provide a syllabus rationale. Such reviews result in greater uniformity in goals and improved outcomes.

Writing in CORE Courses

A fact of undergraduate education at Maryland is that--outside of required courses in Fundamental Studies English--every student graduates with a unique portfolio of CORE courses because of the extensive course choices in the various CORE categories. Writing is important to most of these courses and the range of writing experiences provided by them in categories in addition to Literature is exemplified by the following examples. Students, in the BSCI 105: Principles of Biology I laboratory, learn how to predict results, summarize references, and avoid plagiarism. In CCJS 105: Introduction to Criminology, students write four opinion papers in which they apply theoretical ideas to news of current criminal activity. In CHEM 131/132: Chemistry I/Laboratory, examinations contain a mixture of mathematical and conceptual questions. The conceptual questions ask students to restate new ideas in their own words as a measure of their understanding. In GVPT 170: American Government, students write a critical
book review, a personal essay using concepts from class to reflect on their own political socialization, and short research papers analyzing news media coverage of political campaigns.

V. Oral Communication

Unlike written communication, specific courses in oral communication are not required in the CORE curriculum. Nearly one third of our students take COMM 107: Oral Communication: Principles and Practice before graduating (28% of May 2005 graduates). Many of these students are majors in Business and Journalism, which require the course for all majors. A related Communication course, COMM 200: Critical Thinking and Speaking, provides 100 seats per semester. COMM 200 is a CORE course.

Oral Communication in CORE Courses

Oral communication experiences for students in the CORE courses surveyed for this report range from required graded formal oral presentations for all students to no required oral communication experience. Most sections of the Professional Writing courses require at least one formal oral presentation. NFSC 100: Elements of Nutrition requires at least one oral presentation, as does BSCI 105: Principles of Biology I, which requires students to field questions from teaching assistants and peers about their poster presentations. A large percentage of University Honors Seminars requires one or more oral presentations as part of graded coursework, with emphasis on development of clear, precise oral communication skills.

More common than such individual graded formal oral presentations are such oral communication experiences as discussion, mock debates, performance of poetry or plays, and group work. In many courses, “participation” grades are given for such work, sometimes accounting for 10-14% of the grade. Some high enrollment courses report no graded oral communication component, formal or informal; more oral communication experiences, both in terms of class discussion and formal presentation, are routinely present in the numerous smaller CORE classes not surveyed for this report.

VI. Mathematics and Science at Maryland

With its strength in science, mathematics, and technological fields, the University of Maryland offers students a superb environment for learning scientific and quantitative reasoning. Many of the science and technological departments have state-of-the-art research programs that encourage undergraduate participation. Of these Engineering, Computer Science, Mathematics, and Physics all rank within the top 20 nationally, a credential shared by only 12 other private and public universities nationwide. Spawned within this environment, numerous exemplary science programs foster scientific inquiry for undergraduates. Every semester, the University Honors program offers a range of science and mathematics seminars, many of which bridge scientific fields. Of the pre-med students who enter the University through the University Honors program, the acceptance rate to medical school has been 92% the past two years. Of the 12 College Park Scholars programs, the five that are mathematics- and science-based immerse students in projects that illuminate the importance of scientific and quantitative skills and the value of critical thinking. Gemstone, a four-year, team-based program, engages students from across the university in the application of technical solutions to socially relevant problems. In 2002, the College of Chemical and Life Sciences received significant funding from the Howard Hughes
Medical Institute for its undergraduate program, including support for student research. Interdisciplinary programs help students keep pace with the changing frontiers in biological, physical and environmental science. In 1997, Maryland established the Environmental Science and Policy program [www.agnr.umd.edu/users/ensp/](http://www.agnr.umd.edu/users/ensp/), which draws its curriculum from four colleges.

**VII. Quantitative Reasoning**

The CORE-General Education requirements provide the first university setting through which students develop scientific and quantitative reasoning skills. These requirements provide for a Fundamental Studies mathematics course, along with three additional Distributive Studies Sciences and Mathematics area courses, two of which must be science and one of which must have a laboratory component. While students develop skills in scientific reasoning primarily through the formal science coursework and research opportunities, development of quantitative reasoning also permeates many aspects of the University’s General Education program.

**Fundamental Studies Mathematics**

As part of Fundamental Studies, all students are required to demonstrate competency, at a minimum, at the college level in Intermediate Algebra. These skills include the ability to interpret mathematical models, to represent quantitative and mathematic concepts verbally, symbolically, or visually, and to use basic quantitative reasoning to solve problems. All students’ mathematics skills are evaluated with a Placement Examination [www.math.umd.edu/undergraduate/credit/placement.shtml](http://www.math.umd.edu/undergraduate/credit/placement.shtml) to identify at which level they are suitably prepared for the Maryland program. Some 75% of incoming students place in mathematics courses higher than MATH 110: Elementary Mathematical Models, the lowest level course that fulfills the requirement. The Mathematics Department offers several course options, with appropriate topical foci, depending on students’ academic interests. This variety of offerings provides for the general education mathematics requirement to be integrated into individual majors. Depending on major requirements, students also take additional mathematics courses. For example, students in the physical, chemical, life and earth sciences complete at least two semesters of science-based calculus, whereas students in environmental and social sciences and other areas such as architecture complete a different sequence of calculus courses which emphasize applications more specifically tailored to these disciplines. All such courses have the Fundamental Studies requirement as a prerequisite.

**Developmental Mathematics**

Five years ago, the Mathematics Department began an innovative Developmental Mathematics Program, which subsequently won the campus’s Departmental Excellence in Teaching Award, and was the cover feature in the Mathematical Association of America’s “Focus” magazine in November 2003 [www.maa.org/features/112103devmath.html](http://www.maa.org/features/112103devmath.html). The program includes: intensive courses covering two semesters’ material and a placement exam in a single semester, as well as self-paced, computer-based, modules that help the students at the
lower end of the Mathematics Placement performance move on to the Fundamental Studies courses as quickly as possible. The success rate for the intensive courses exceeds the combined success rates for the prior arrangement of two semesters. The innovative program appears to contribute to the improvement of retention and graduation rates which have risen steadily in the past five years. A survey of students showed overall satisfaction with the Fundamental Studies Mathematics Program.

Mathematics in CORE Courses

Many of our high-enrollment CORE classes provide undergraduates at Maryland further development of both quantitative reasoning and critical thinking. In all of the sciences, and specifically the high-enrollment introductory Biology and Chemistry classes, as well as in Math 140: Calculus I and MATH 220: Elementary Calculus I, the opportunity for growth in these skills is considerable, with significant emphasis placed on statistical approaches, quantitative analysis of data, and conceptual reasoning rather than simple numerical solutions to formulaic questions. Faculty members assess skill development throughout the semester to help students practice and build upon their work.

Fields in addition to Mathematics and Science also build students’ quantitative reasoning skills. In CCJS 105: Introduction to Criminology, students use knowledge from scientific areas in analysis of criminal behavior. In PHIL 100: Introduction to Philosophy, students use deductive and inductive reasoning as applied in physics, biology, linguistics, medicine and jury trials. In ECON 200: Principles of Micro-Economics, students learn “rational choice theory,” analogous to quantitative and critical thinking in explaining and/or predicting political behavior both locally and globally. In Journalism 150: Introduction to Mass Communication, students use statistical analysis of trends in media economics to study their impacts on marketing and media product viability.

VIII. Scientific Reasoning

Scientific reasoning is a fundamental skill developed in all science classes at Maryland, including those within the CORE curriculum. In much of the work in lecture and laboratory, students develop and practice their scientific reasoning skills in a variety of ways. Science students complete written exercises in the form of laboratory reports, scientific papers, and poster presentations. They work individually and in groups; they participate orally in discussion and through formal oral presentations. Through presentation and writing in science classes, students refine their focus on and skill in scientific reasoning.

Generally, the CORE science program is organized so that students achieve their general education goals with a two-course sequence during which they are exposed to scientific reasoning through more in-depth coverage in one discipline, rather than receiving broad exposure to both physical and life sciences. While there are many laboratory and non-laboratory offerings available, a relatively small fraction of them are in the category of high-enrollment courses. In the physical sciences, this situation results from a Department of Physics decision to offer a variety of courses with small enrollments, such as PHYS 102/103: The Physics of Music and PHYS 106/107: The Physics of Light. The Department of Physics offers separate introductory Physics tracks for various majors, such as Life Sciences, Chemistry, Physics and Engineering, tailoring both the course content and the level of formal mathematics to the needs
of the students. This variety allows CORE-General Education to be integrated into the curricula of our majors.

The high-enrollment course sequence BSCI 105/106: Principles of Biology I/II include scientific reasoning as a specific lecture topic, accompanied by discussion of crucial experiments that support major biological concepts. To foster student discussion and critical thinking, the course offers presentations and evaluation of alternative theories. Many of the science courses introduce model building as a mechanism to develop conceptual understanding. In CHEM 131/132: Chemistry I/Laboratory, faculty link notions of molecular shape and dimensionality to the underlying mechanisms of receptor biochemistry and the role it plays in evaluating drug interactions in the field of medicine.

For all students, training in CORE classes allows students to develop basic laboratory skills such as data processing and analysis, the use of typical scientific instruments, project organization, and presentation and communication of results. Because opportunities for involvement in research abound across the campus, students can stay involved in research in a variety of ways: through the Undergraduate Research Assistantship Program, through other courses, through internships, or as paid hourly employees. Many departments, particularly in engineering and the sciences, maintain a web page with advertised positions for undergraduate research.

Nurturing the Study of Science

The campus takes pride in the degree to which it attracts and nurtures talented students who show a strong interest in science upon arrival. A significant challenge for the next decade and beyond is to engage those students who do not come to campus with that predisposition. As pointed out in the recent National Academies study, "Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future" [www.nap.edu/catalog/11463.html], many countries around the world now outpace U.S. universities in attracting and retaining high-achieving students in scientific and technical fields, resulting in increased competition for high quality employees. U.S. universities will need to produce outstanding scholars in science and technology and in related fields to fuel our scientific strength and economic growth. That production depends in part on being able to attract students to the scientific fields. For related reasons, high interest also exists in producing a general public that is science literate.

Facilities for Science and Mathematics Education

The condition of Maryland's research laboratories poses a special challenge. While many research laboratories on campus are state-of-the-art, many teaching laboratories, particularly those used by students who are not majoring in science, have outdated equipment in older classrooms. Our teaching laboratories and mathematics lecture halls, which often fall short of the laboratory facilities in the high schools our students attended, give students their first impression of science and mathematics at Maryland. It is critical, especially for students not already engaged in science, to come away from their CORE science classes with an understanding of science and mathematics as modern, forward-looking and ever-changing. In place are the extraordinary Computer Science Instructional Center and the Jeong H. Kim Engineering Building. Underway is the Biosciences Research Building and a new Physical Sciences Complex. But in instances where outmoded facilities now and in the future affect the
productivity and interest of undergraduate science and mathematics majors and non-majors, the short-falls in science and mathematics education at Maryland are in plain view.

IX. Technology Fluency

In the university context, technology encompasses information technology (e.g., computers, networks, servers, and databases) and laboratory technology (e.g., instruments and equipment). Both kinds of technology are important in the CORE curriculum at Maryland. See the University’s February 1, 2006 Mission and Goals Statement Objective 1.8 www.provost.umd.edu/Strategic_Planning/MissionAndGoals2006.pdf.

Information Technology

The University of Maryland has made a strong commitment to technology fluency as expressed in the report found at this site: www.oit.umd.edu/ITforUM/2002/Spring/infolit/. Accordingly, campus life at the University of Maryland immerses its students in information technology (IT) as a means of solving problems, creating solutions, and planning learning and career activities. All students upon entering the University are assigned a system level username, password, email address, and storage area for web pages. The University’s IT infrastructure from enterprise systems to wireless networks was designed by the Office of Information Technology www.oit.umd.edu to provide a complete, integrated, digital environment to support nearly all educational, community, and personal activities on the campus and beyond.

Many courses involve some form of blended learning combining classroom and Internet access to course materials using course management platforms such as WebCT www.courses.umd.edu, Blackboard, WebBoard and virtual community platforms. Technology Enhanced Classrooms provide multimedia presentation platforms, campus cable, video conferencing, and interaction response systems (e.g., clickers). Since 1990, the University has supported the development of Electronic Teaching Theaters www.oit.umd.edu/tt to explore innovative methods of teaching and learning; and since 1993, conferences on Teaching with Technology www.oit.umd.edu/twt/ have promoted the innovative use of technology in all courses.

Laboratory Technology

The University of Maryland is a research university with a faculty active in laboratories equipped with state-of-the-art technology. Technological fluency is required in many classroom and laboratory settings, where students have both hands-on experiences and state-of-the-art digital simulations. Students taking courses in the College of Arts and Humanities work in computer labs to create text and art and to search for literature and resources. Journalism and behavioral science students learn data management techniques and search procedures for government documents. All of these laboratory-style activities require and teach technology fluency.

Technology Fluency in CORE Courses

Examples of course content that develops technology fluency are found throughout the CORE curriculum, as shown in the following examples:

- In BSCI 105: Principles of Biology I, students learn five laboratory technologies: microscopy, spectroscopy, layer chromatography, electrophoresis, and bioinformatics. In BSCI 106:
Principles of Biology II, students use computer programs such as PAUP and McClade for laboratory exercises, and take lab quizzes online.

- In BSCI 223: General Microbiology students use online materials with lab images and lab procedures.

- In CHEM 132: General Chemistry I Laboratory, students take all quizzes and homework assignments online and use basic instrumentation and experimental equipment.

- In the following courses--ENGL 101: Introduction to Writing, ENGL 234: Introduction to African-American Literature, ENGL 391: Advanced Composition/393: Technical Writing; and WMST 250: Introduction to Women’s Studies: Women, Art and Culture—students access course materials via WebCT, submit assignments online, and use WebCT for class commentary and general communication.

- In Architecture CORE courses, students learn and learn about to the technologies available for the study of architectural history and images. A number of Architecture courses use 3-D modeling software in their Architecture Computer Resource Center acrc.umd.edu/ACRC.

- In KNES 260: Science of Physical Activity and Cardiovascular Health, students learn technologies used in the study of physical activity.

- In JOUR 175: Media Literacy students make extensive use of Internet media and resources and attend library sessions on the range of resources available in different media formats.

X. Information Literacy and Critical Analysis and Reasoning

Commitment to Information Literacy

The University of Maryland is committed to information literacy in its CORE curriculum. The Libraries’ Information Literacy Team (ILT) was established in 2001 to “advance the information literacy of UM students and faculty, by contributing to the Libraries' mission of instructing and educating in the use of information resources required for meeting the education, research and service mission of the University” www.lib.umd.edu/UES/ilt.html. The Libraries’ program of information literacy instruction, founded a decade ago, has evolved to meet the challenges of a rapidly developing information technology environment and a new generation of users.

The campus environment that includes the Office of Information Technology www.oit.umd.edu and the University Libraries www.lib.umd.edu/ facilitates information access through tools such as the Research Port gateway www.researchport.umd.edu, information literacy, and critical thinking www.lib.umd.edu/UES/evaluate.html.

Information Literacy/Critical Analysis and Reasoning in CORE

In their orientation to the University, students are introduced to the physical and virtual Libraries as a gateway to facilitate their learning, and this use of technology is reinforced as students move through their CORE courses and into academic majors. In ENES 100: Introduction to Engineering Design, students receive instruction and hands-on practice in the use
of the specialized engineering materials such as patent searches, handbooks, journals, and technical reports and conference proceedings.

Nearly every CORE course in the College of Behavioral and Social Sciences deals with understanding information in the discipline and emphasizes critical analysis of the evidence. Librarians teach information literacy sessions for many courses and prepare customized online tutorials that provide access to specialized databases, e-journals and reference sources. In the College of Arts and Humanities, all of the high- enrollment courses focus on critical evaluation of written material, whether in lecture, discussion, assignments, or testing. In NFSC 100, Elements of Nutrition, students analyze and critique food labeling, advertising, media coverage, and diet claims.

In the School of Architecture, Planning, and Preservation, CORE and major courses introduce students to Architecture's The Elizabeth Alley Visual Resource Collection featuring more than 300,000 images (digital, slide, and video. In HISP 200: The Everyday and the American Environment, the required research paper includes an annotated bibliography and graphics (drawings, diagrams, and/or photographs). Students both synthesize and analyze the information they find through their research, in order to form informed opinions and evaluations of their subject matter. In JOUR 175: Media Literacy, students examine the subliminal and unintended effects of media. Students in BSCI 125: Plant Biology Laboratory complete a lab exercise that requires them to locate and cite specialized biological materials, and to locate and evaluate a credible website.

Library Resources for Undergraduate Research

The University of Maryland libraries emphasize and facilitate research opportunities through easily accessible (online) databases and resources and via staff specialists available to assist with individual projects or courses. The library homepage www.lib.umd.edu/ provides direct access to a Research Port with direct access to 123 regional, national, and international databases as well as online journals and primary literature. The library staff has individual experts in 103 subjects www.lib.umd.edu/UES/specialists.html available to assist individual students or classes locate information resources in a particular discipline. Ninety-eight courses have individual course-related links on the library site www.lib.umd.edu/UES/tutorials.html explaining how to proceed through various research steps for a particular class. The library website also hosts a link to information relevant to research resources in each major www.lib.umd.edu/UES/library_guides_subject.html. The library site provides clear information on formatting a research bibliography www.lib.umd.edu/UES/library_guides_format.html, evaluating web sources www.lib.umd.edu/UES/evaluate.html, and the ethics of academic integrity www.lib.umd.edu/UES/honesty.html. There are many online tutorials within the library site to assist students in accessing information and resources, and all students in transition courses for first-year students (e.g. UNIV 100: The Student in the University, HONR 100: Honors Colloquium, GEMS 105: Freshman Honors Colloquium: Introduction to Gemstone, as well as ENGL 101: Introduction to Writing) receive comprehensive, hands-on instruction on library research skills.

General Education and the University’s Research Mission

Consistent with the University’s emphasis on research, nearly every high-enrollment course surveyed for this report teaches research skills and structures at least one assignment around research themes. In introductory courses in Psychology, Economics and other fields,
students learn about standards of reliability and validity. They discuss the integrity of data and of analytical approaches, and they learn the demands of human subjects review and other processes that guarantee respectful treatment of human and animal subjects in research. In addition, students must engage in ethical practice in the presentation of their own work and in the citation of the work of others.

Because campus faculty are active researchers, students in many CORE classes learn from professors who are experts in their fields and able to present the forefront thinking, techniques, and perspectives in a discipline. One such example is Dr. Art Popper, who, when teaching BSCI 105, Principles of Biology I, talks about his research on the nervous system when the class covers that and related topics. In addition, Dr. Popper says he frequently will “schill” for other faculty by mentioning their current research projects when relevant to activities in BSCI 105.

In Support of General Education and Development

Three other major campus initiatives, while awarding no CORE credit, also provide invaluable support for the CORE program: the Maryland Center for Undergraduate Research, the First Year Book program, and the Orientation Program’s UNIV 100 and UNIV 101. Each of these programs provides students with academic development opportunities. The Maryland Center for Undergraduate Research [www.ugresearch.umd.edu/](http://www.ugresearch.umd.edu/) is an initiative of the Office of the Dean for Undergraduate Studies that serves as a resource for both students and faculty to match interests and share research ventures. In addition, 32 departmental and college Honors programs offer undergraduate research Honors programs as listed at [www.honors.umd.edu/departmentalhonors.html](http://www.honors.umd.edu/departmentalhonors.html). Some Colleges have websites that are fully dedicated to undergraduate research, including the College of Computer, Mathematical, and Physical Sciences [www.cmps.umd.edu/undergraduate/research.htm](http://www.cmps.umd.edu/undergraduate/research.htm), the College of Chemical and Life Sciences [www.life.umd.edu/research/undergrad-research.html](http://www.life.umd.edu/research/undergrad-research.html), and the Clark School of Engineering [www.engr.umd.edu/research/research_opportunities.html](http://www.engr.umd.edu/research/research_opportunities.html).

Since 1993, the First Year Book Program provides all new students with a provocative book to discuss from a variety of academic and personal perspectives. Most recently, *Thurgood Marshall: American Revolutionary* by Juan Williams, *The Stakes* by Shibley Telhami, *Dead Man Walking* by Sister Helen Prejean, *The Laramie Project* by Moisés Kaufman, and *Blessing the Boats* by Lucille Clifton have provided the opportunity for this shared intellectual experience. Through special course segments, lectures, discussions, and projects, the First Year Book program helps students to integrate the principles of CORE-General Education. A keynote presentation by the book’s author highlights each year’s programming [www.firstyearbook.umd.edu](http://www.firstyearbook.umd.edu).

UNIV 100 and 101 are one- and two-credit seminars sponsored by New Student Orientation to promote the success of entering students. In place since fall 1986, these courses introduce students to the rigor and resources of the University, including the CORE curriculum and issues related to student success. Nearly one hundred sections of UNIV 100 or 101 are offered each fall with class size of fewer than 25.

XII. Assessment
Since 1992, the University has conducted periodic review of approved general education courses, a process overseen by a standing committee of the University Senate, the University Senate Committee on CORE [www.senate.umd.edu/documentsthatgovern/ByLaws/Art6.html](www.senate.umd.edu/documentsthatgovern/ByLaws/Art6.html). Normally, courses become eligible for periodic review five years after approval. If the original approval or subsequent review of a CORE course raises concerns, the course may be reviewed again the following year to determine whether and how the concerns have been addressed. Periodic Review has helped to keep the CORE Program vigorous and flexible, with many positive results [www.ugst.umd.edu/core/overview/CoursAp.html](www.ugst.umd.edu/core/overview/CoursAp.html). Over 26 semesters, the CORE Committee completed 361 reviews through its faculty subcommittees.

Syllabi, sample assignments, and examinations comprise periodic review portfolios, along with statements from faculty about the current status of the course, changes over time, responses to questions raised previously, and future plans. These statements help the CORE Committee understand the ways in which individual courses change in response to changes at the University (enrollment patterns, resources, etc.), world events, new discoveries and research, and experience gained from student progress in the courses.

In their CORE portfolio statements, faculty report positive course developments, based on closing the feedback loop from the prior review, as illustrated for Theatre 110: Introduction to the Theatre (addition of problem-based learning modules, library resources [www.lib.umd.edu/MCK/thet110korey.html](www.lib.umd.edu/MCK/thet110korey.html) and WebCT); for SOCY 100: Introduction to Sociology (development of a training seminar for teaching assistants; active learning increased to include a variety of writing assignments and class presentations); MATH 140: Calculus I (new “close contact” version of the course with a small-group setting, web-based homework called “WebAssign” [www.math.umd.edu/undergraduate/webassign](www.math.umd.edu/undergraduate/webassign), which gives students “instant feedback”). Periodic review of general education courses allows faculty, departments, and the committee to reconsider the place of any course in an ever-changing curriculum and acknowledge their oversight of the course.

Growing an Outcomes Environment

Like the rest of the University, the CORE-General Education program is in the process of transitioning to a student learning outcomes environment, a move that will enhance the assessment measures already in place. In 2004-2005, in the context of the ongoing work of the Provost’s Commission on Learning Outcomes Assessment, the CORE faculty subcommittees wrote learning outcomes statements for all Distributive Studies categories and for Human Cultural Diversity. The Freshman Writing Program, Professional Writing Program, and the Department of Mathematics wrote the statements for CORE Fundamental Studies. The Senate CORE Committee approved these statements in October 2005, when they were posted on the websites of the Senate [www.senate.umd.edu](www.senate.umd.edu) and the Commission [www.umd.edu/LearningOutcomes](www.umd.edu/LearningOutcomes). Consistent with the University’s February 1, 2006 *Mission and Goals Statement* Objective 1.5 and 1.7 [www.provost.umd.edu/Strategic_Planning/MissionAndGoals2006.pdf](www.provost.umd.edu/Strategic_Planning/MissionAndGoals2006.pdf), faculty had mapped CORE courses to the CORE learning outcomes statements by March 15, 2006, and a revised CORE course proposal form is now in place that will include mapping future courses. This is. In collaboration with various faculty groups, the Dean for Undergraduate Studies is developing a learning outcomes assessment plan for general education. As part of that process, a six-member faculty team attended a Middle States Assessment Institute in January 2006.
XI. Conclusions and Recommendations for General Education

As a result of this self-study, members of the Standard 12 Subcommittee came to the following conclusions, which we present within the categories used to organize our report. We also offer several recommendations.

Diversity, Ethics and Values

Strengths: Through its Human Cultural Diversity requirement, the University of Maryland has provided diversity studies in general education for 15 years. Indicative of high faculty interest, over 200 Diversity courses have CORE approval. Recognizing that issues of diversity often have strong congruence with matters of ethics and values, the committee also noted that values and ethics are omnipresent throughout the CORE curriculum, most particularly the ethics and values that underlie excellent research, that find representation in literature and the arts and in the social sciences and that provide the foundations for academic integrity.

Challenges: The Committee recognizes that the social and political contexts that raise new issues in relation to diversity, values, and ethics are always in flux. Current national attention to the educational value of diversity provides a compelling context for assessing the goals and outcomes of courses in this category. New assessment projects of the Office of Institutional Research and Planning related to understanding the educational benefits of diversity may inform plans for teaching about diversity, ethics, and values in the coming years.

The Committee recommends that the University
- provide strong support for the development of new courses in these areas so that the faculty will continually reinvigorate the curricula.
- encourage faculty to review their syllabi regularly in light of recent local and international events.

Written Communication

Strengths: The Committee found programs in both Freshman Writing and Professional Writing to be exemplary in terms of content and administration. Based on feedback the Professional Writing Program has received from units across campus, the roster of professional writing courses continues to be revised and expanded to meet developing needs. In addition, meaningful and substantive writing assignments exist across the high-enrollment CORE courses, helping students learn appropriate writing for different fields of study.

Challenges: Across the University, in all fields, increases in class size, together with the reduction in the number of teaching assistants available for discussion and laboratory sections, has resulted in a reduction in the number and frequency of writing assignments. Only adequate funding can ensure that Maryland students continue to write across the curriculum.

Oral Communication
Strengths: The Committee recognizes the importance of presentation skills in both academic and professional settings and commends the emphasis placed on such skills by some majors, as well as in the activities sponsored by the Division of Student Affairs. The Committee also determined that existing Communication courses are strong and serve students well.

Challenges: All students should leave the University having had repeated opportunities to develop oral communication skills across lower and upper levels of coursework. The Committee does not, however, recommend a specific CORE course be required of all students in order to meet this need.

The Committee recommends that the University
- investigate appropriate ways to bring COMM 107 or a similar course into the CORE curriculum.
- increase the number of seats in Communication classes and encourage faculty to increase oral communication components in CORE classes.
- encourage faculty to include graded oral presentations as a common feature in the curricula of all majors.
- make available to faculty exemplary rubrics for assessing oral communication across the curriculum.

Quantitative Reasoning

Strengths: The Committee was impressed by the strength of the CORE curriculum in this area and particularly by the leadership of the Mathematics Department in establishing the Developmental Mathematics program. We also found quantitative reasoning skills used widely in other areas of the CORE curriculum, especially in the sciences and social sciences.

Challenges: Mathematics-resistant students present special challenges in an era in which quantitative literacy is a requirement for many professional careers and a necessity in many aspects of life in a fast-paced and complex society.

The Committee recommends that the University
- make available to faculty exemplary rubrics for assessing quantitative reasoning across the curriculum.

Scientific Reasoning

Strengths: CORE courses in the sciences at Maryland are rigorous and content-focused, emphasizing scientific method and research practices. Given the national prestige of the science, mathematics, and technological fields at the University of Maryland, the University offers faculty and students a superb environment for the teaching and learning of scientific reasoning.

Challenges: The science and technology community in the U.S. is challenged to meet the nation’s needs in the scientific and technological areas.

The Committee recommends that the University
- commit to making science education a continuing hallmark of undergraduate education at the state’s flagship campus.
- develop a set of innovative courses (both high- and low-enrollment) that newly engage students in applying scientific principles and knowledge, in some cases with inclusion of contemporary issues. Pegged to creating at Maryland a national model for science education, such courses would foster a culture of scientific literacy on campus by appealing to both non-majors and majors. The stated goals of such courses would include interesting more students in majoring in science and helping others become more informed consumers of scientific research and information.
- upgrade and modernize science laboratories for the non-major courses and mathematics lecture halls.

Technology Fluency

Strengths: The University has long been a leader in providing excellent internet technology and access for students and faculty. Students are initiated into campus technology culture from Orientation forward. Many CORE classes use online resources, including WebCT, and faculty may attend regularly offered workshops on teaching technologies.

Challenges: Rapid change and high cost present continual challenges to all aspects of technology services.

The Committee recommends that the University
- provide online access to a great range of learning materials, including syllabi and class websites.
- systematically and programmatically remove barriers that inhibit use of technology for students and faculty. For example, faculty across the University need adequate technology support in technology classrooms.
- develop more CORE courses that address the increasing complexity of communication and information systems, including but not limited to such topics as media ownership, data sharing and surveillance, intellectual property rights, potential and actual effects of the Patriot Act, and the so-called information gap. CORE should continue to help equip students with the knowledge and skills to navigate the vast and complex flow of information that is widely available to them.

Information Literacy/Critical Analysis and Reasoning

Strengths: The University of Maryland is proud of its healthy, budding undergraduate research program. Each year, more than 400 students present their research projects at Undergraduate Research Day. The research showcases held by Gemstone, McNair, and College Park Scholars swell this number, indicating an exceptional degree of involvement for undergraduate students in primary research.

Challenges: Our challenge is to increase the number of student involved in research.

The Committee recommends that:
- the University develop a strategic plan to maximize its already strong programmatic presence in student research with a goal of making the University a national leader in this field.
- CORE courses regularly incorporate appropriate research skills and processes into their curricula.
- the University establish Sophomore and Junior Summer Scholars programs that are parallel to the Senior Summer Scholars program.
- all colleges and departments sponsor websites dedicated to undergraduate research opportunities.
- more funding be provided for student trips to conferences where they can present their research.