
Nonproliferation Education in the United States Part I: Undergraduate Education

*A Nonproliferation Review Survey*¹
of Teaching at Leading U.S. Colleges and Universities on
Weapons of Mass Destruction and
Means to Combat Their Proliferation and Use
A Two-Part Series

North Korea is a regime arming with missiles and weapons of mass destruction, while starving its citizens. Iran aggressively pursues these weapons and exports terror, while an unelected few repress the Iranian people's hope for freedom. Iraq continues to flaunt its hostility toward America and to support terror. The Iraqi regime has plotted to develop anthrax, and nerve gas, and nuclear weapons for over a decade. . . . States like these, and their terrorist allies, constitute an axis of evil, arming to threaten the peace of the world. By seeking weapons of mass destruction, these regimes pose a grave and growing danger.

— President George W. Bush
State of the Union Address, January 29, 2002

As the United States readies for a possible war to eliminate Iraq's weapons of mass destruction (WMD), confronts North Korea over its clandestine efforts to produce nuclear arms, and implements an array of billion-dollar programs to meet the WMD challenge, how are America's colleges and universities responding to this threat?

Are they adapting their curricula to a world that may be as fraught with perils to this country as those it confronted during the Cold War? Are they training the next generation of scholars, diplomats, and leaders who will be needed to meet the trials that lie ahead, from nuclear-armed rogue states to WMD-wielding terrorists? Will they serve as the centers of conceptual innovation and moral vision, as the United States contends with unpredictable and increasingly dangerous foes?

From February to October 2002, the *Nonproliferation Review* undertook a survey of teaching on WMD at leading U.S. institutions of higher learning to seek answers to these questions. It was also hoped that the survey would help to create a more effective network among those teaching in the field, allow the sharing of syllabi and innovative teaching practices, stimulate the expansion of courses on WMD, and bring additional public attention to instruction in this area.

Originally, it was the intent of the *Review* to focus specifically on education regarding *nonproliferation*—the institutions and strategies for curbing the spread and potential use of WMD. It soon became clear, however, that instruction on this topic was concentrated at the graduate level. At the undergraduate level, except in very rare instances, students were introduced to nonproliferation

in the context of wider-ranging courses dealing with multiple WMD issues (such as the decision to use the atomic bomb against Japan or nuclear doctrine during the Cold War) or in the context of even more generalized courses on foreign policy or international conflict.²

This article, Part I of a two-part series, thus presents and discusses the results of this survey with respect to undergraduate education on weapons of mass destruction at selected colleges and universities. Part II of this series, to appear in the next issue of the *Nonproliferation Review*, will examine the specific topic of nonproliferation education at the graduate level. (Readers may also be interested in an important, more broadly focused study by the United Nations on Disarmament and Nonproliferation Education programs, courses, and curricula around the globe, released in October 2002.)³

The *Nonproliferation Review* survey design is discussed in detail below. In brief, the survey examined a sample of undergraduate programs at 78 leading U.S. institutions of higher learning, as identified in the widely used rankings of *U.S. News and World Report* for 2001.⁴ Focusing on departments of political science, government, and international relations, the survey sought to determine the number and content of courses devoted principally to WMD issues (75 percent of course time) and the number and content of more general courses, such as those on U.S. foreign policy or international security, that devoted one or more weeks to WMD issues. Data were collected via an electronic questionnaire, supplemented by syllabi and telephone interviews with a wide range of those teaching in the field at the institutions surveyed.

SUMMARY OF PRINCIPAL FINDINGS

- Although most of the *U.S. News and World Report* top-ranked undergraduate institutions offer at least one generalized course that touches upon WMD for one or more weeks, more than two-thirds of the country's leading non-military colleges and universities did not offer any undergraduate courses devoted principally to WMD issues. The list of schools lacking such courses includes the school *U.S. News and World Report* ranked as the country's premier public university, the University of California, Berkeley; the school ranked as foremost U.S. technical university, California Institute of Technology; and the nation's top eight liberal arts colleges: Amherst, Swarthmore, Williams, Wellesley, Bowdoin, Carleton, Haverford, and Pomona.
- A handful of undergraduate programs—ten, in all—offer students more than one course focused on WMD: Princeton; Yale; Stanford; Johns Hopkins; University of Virginia; University of Michigan; University of California, Los Angeles; University of Illinois, Urbana-Champaign; Georgia Institute of Technology; and the University of Washington. All of these undergraduate programs are elements of major universities.
- Each of the four U.S. military academies addresses the threat posed by WMD with a specialized course.
- There was considerable similarity in approaches to teaching WMD issues among the schools surveyed. The great majority of courses in military and civilian institutions presented WMD from the national security perspective—rather than from the perspective of peace studies or international organizations/cooperation—and covered many of the same issues.
- Multiple factors contributed to the limited interest in WMD instruction at civilian institutions. Interviews indicated that the leading reasons include the lack of student interest in WMD issues during the 1990s, after the end of the Cold War and the eclipse of policy studies in many departments of political science during the 1990s, in favor of the theoretical and quantitative aspects of the discipline.
- The events of September 11, 2001, stimulated new courses or amended course content at a number of schools but have not yet reversed these broad trends. Strong student interest in national security-related courses at a number of undergraduate schools may indicate increased pressures for greater attention to such issues, but at many schools rapid change is not likely because of the delay entailed in altering research preferences of existing senior faculty and in hiring new faculty to teach in this field.
- A number of physics departments have courses focused on nuclear weapons, but a parallel trend of instruction regarding biological weapons—seen as the gravest emerging WMD threat—is only beginning in departments teaching in the biological sciences.

BACKGROUND AND METHODOLOGY

Recognizing the growing importance to U.S. national security of the spread of weapons of mass destruction to new states and, potentially, to transnational terrorist groups, the *Nonproliferation Review*, using the resources of the CNS Washington, DC, office undertook a survey of teaching on this subject at prominent U.S. institutions of

higher learning. Specifically, the survey sought to compile data on courses at these schools that contained content on the threats posed by WMD—chemical, biological, and nuclear weapons and their delivery systems—and on efforts to combat their proliferation and use.

The basic goals of the investigation were to:

- Obtain a sense of the overall level of attention to WMD proliferation on the part of the nation's foremost colleges and universities, as measured by the number of formal academic courses devoted to this subject in their curricula
- Gain an understanding, through the examination of syllabi, of the content and focus of current teaching on WMD proliferation and identify possible trends
- Learn what instructors consider the most successful approaches for teaching the subject in the classroom.

In addition, it was hoped that the survey would establish a baseline that could be used in future years to observe changes in this field, facilitate networking among those working in the field, and stimulate added attention to this subject area at institutions of higher education and among the public.

As noted above, the institutions surveyed fell into four broad categories:

1. Undergraduate programs at the 25 leading national universities, as identified by *U.S. News and World Report*⁵
2. Undergraduate programs at the 27 leading publicly supported universities (i.e., universities supported by individual state governments, but usually attracting students from all of the United States and abroad), as identified by that publication⁶
3. Undergraduate programs at the 25 leading national liberal arts colleges, as identified by that publication⁷
4. Undergraduate programs at the four U.S. military service academies.⁸

The survey employed a web-based questionnaire to gather data about courses at the surveyed schools. The questionnaire first asked respondents to identify courses at their institutions whose principal focus (more the 75 percent of content) was examining “the threats posed by weapons of mass destruction and efforts to combat their proliferation and use” (“specialized” courses) and to identify other, broader courses that addressed these topics as a lesser part of their content (“general” courses).⁹

For all courses, respondents were asked to provide basic information on the audience for the course (undergraduate only, or undergraduate and graduate students), the level of the course within such a program (introduc-

tory or advanced), how often the course was given, the number of students, cross-listing with other departments, principal readings, and the like.

For specialized courses, respondents were also queried about the teaching and evaluation methods used. In addition, instructors for these courses were asked to provide syllabi.

To identify appropriate questionnaire respondents at each school, CNS staff reviewed the school's on-line course listings to identify one or more faculty member teaching a course specifically addressing WMD or a closely related subject, such as national security or contemporary U.S. foreign policy. CNS staff then contacted the faculty member by telephone and/or e-mail to solicit his or her participation in the survey and to inquire about others at the faculty member's school who might be teaching in the field. These faculty members were then similarly contacted, with the goal of identifying all relevant faculty at each institution and engaging them in the survey. In addition, the direct exchanges with faculty were used to obtain anecdotal information and assessments about teaching on WMD issues. At least one faculty member was contacted at every school or program in the sample.

The searches and contacts focused on departments of political science, government, and international relations, but at a substantial number of universities, CNS staff also examined course offerings in departments of history and in regional studies departments covering the Middle East, South Asia, and Northeast Asia. Offerings at a smaller sample of departments of physics and biological sciences were also reviewed, and relevant faculty contacted.

In all, more than 125 faculty members were consulted during the course of the survey and questionnaires were completed for more than 150 courses at 78 undergraduate institutions. Of these, 41 were specialized courses.

Not every relevant faculty member completed the questionnaire; questionnaires were, however, completed for all of the specialized courses at the institutions in the sample. Although it was not possible to contact every faculty member teaching more generalized courses that touch upon WMD issues—a group of courses that includes introductory undergraduate courses in international relations—questionnaires on one or more such courses were received from 94 percent of the universities in the survey.¹⁰

The assessments and judgments presented herein are derived from data provided by completed questionnaires,

from the information obtained by e-mail and telephone exchanges with relevant faculty, and from course syllabi. Although considerable effort has been made to ensure the accuracy of this data, it is possible that some relevant courses have been overlooked because of such factors as changes in course offerings made after a particular school was surveyed, inaccuracies in school catalogues, or the unfamiliarity of faculty members contacted with the offerings of some adjunct instructors.

SURVEY RESULTS

This section describes instruction regarding WMD within the undergraduate programs of the top 25 national universities, the top 27¹¹ public universities (a list that partially overlaps the top 25 national universities), and the top 25 liberal arts colleges.

In examining teaching on WMD at undergraduate institutions, an initial question to be answered is how much might an interested student learn about the subject by pursuing courses offered by his or her school during a typical undergraduate career. It appears that a student might acquire an appreciation of these issues at roughly three levels. He or she might be able to learn very little about the subject, if, for example, the school in question addressed it merely for a week or two in a single introductory course on international relations. The student might learn a good deal more if the subject were presented as an element of multiple, more advanced general courses, and the student could acquire the start of an expertise if the subject were presented in one or more specialized courses. Presumably, students in the second and, more likely, in the third category might gain enough familiarity with the subject, and with professors interested in it, to consider pursuing this area further in graduate school. They would also be more likely to maintain an interest in the subject as they pursued careers in other areas—contributing to a better-informed citizenry, as the United States meets the challenge of weapons of mass destruction in the future.

It should also be recognized that students have important opportunities to learn about WMD outside of their classrooms. A number of universities, for example, have internationally recognized research centers pursuing work on WMD issues, where undergraduates may serve as research assistants, attend seminars, and otherwise involve themselves in this subject. Such centers can be found, for example, at Princeton; Harvard; Stanford; the University of Georgia; the University of California (UC), San Diego; and at Columbia University, whose School of Education has an active Peace Studies program. Students

can also pursue this subject through internships in connection with “Washington Semester” programs or during summer vacations. A number of non-governmental organizations offer such internships, as does at least one center associated with a graduate program, the Center for Nonproliferation Studies at the Monterey Institute of International Studies. Distance learning opportunities and extensive web-based resources are also available to students interested in learning more about WMD issues, including self-paced tutorials on key issues.¹² The survey described here, however, focuses exclusively on classroom instruction.

National Universities

Table 1 summarizes the offerings of general and specialized courses addressing WMD at the top 25 national universities¹³ during the 2001-2002 or 2002-2003 academic years.¹⁴ The table indicates that among these schools, 22 (or 88 percent) had two or more undergraduate courses addressing this topic at some level during the period covering the current and prior academic year.

Of the schools offering two or more courses addressing WMD, only 12 offered students at least one specialized course on this subject. Thus, only 48 percent of the top 25 national universities offered any courses at the undergraduate level specializing on WMD issues. Yale University had the greatest number and diversity of relevant undergraduate course offerings, including general and specialized courses in its political science, history, and history of science departments.¹⁵

Two schools appeared to offer only a single course that touched on this issue as a unit in a more general, often introductory, course—Northwestern University and Washington University (St. Louis, Missouri). California Institute of Technology, the nation’s most prominent technical university, appeared to offer no courses touching on this subject. General courses with units on WMD at the schools in this sample included courses on:

- International politics/relations (Duke, Columbia, Dartmouth, Cornell, Johns Hopkins, Notre Dame, UC Berkeley, Carnegie-Mellon)
- International organizations/UN system (Yale, Brown University, University of Chicago)
- International security (University of Pennsylvania, Duke, Northwestern, Cornell, Brown)
- U.S. national security policy (Yale, Princeton, Massachusetts Institute of Technology (MIT), Rice, Notre Dame)
- U.S. foreign policy (Columbia, MIT)
- War/international conflict (Chicago, Cornell, University of Virginia)

TABLE 1
SUMMARY OF GENERAL AND SPECIALIZED UNDERGRADUATE COURSES ADDRESSING WMD AT THE 25 LEADING NATIONAL UNIVERSITIES

National University	Rank	Single General Course	Two or More General Courses	Single Specialized Course	Two or More Specialized Courses
Group I – One or More General Course and One or More Specialized Course					
Princeton	1		•		•
Harvard	2		•	•	
Yale	3		•		•
Massachusetts Institute of Technology	5		•	•	
Stanford	6		•		•
University of Pennsylvania	7		•	•	
Cornell	14		•	•	
Johns Hopkins	16	•			•
Emory	16		•	•	
University of Virginia	21		•		•
Georgetown	23		•	•	
University of Michigan	25		•		•
Group II – Two or More General Courses, No Specialized Courses					
Duke	8		•		
Columbia	9		•		
Dartmouth	9		•		
University of Chicago	9		•		
Rice	12		•		
Brown	16		•		
Notre Dame	19		•		
University of California, Berkeley	20		•		
Vanderbilt	21		•		
Carnegie-Mellon	23		•		
Group III – Single General Course, No Specialized Courses					
Northwestern	12	•			
Washington University	14	•			
Group IV – No General or Specialized Courses					
California Institute of Technology	4				

- The Cold War (Yale, University of Virginia, Georgetown)
- Regional studies, for example, on South and/or East Asia (Georgetown, University of Chicago)
- Terrorism (Georgetown).

As one example of the treatment of WMD in a more general course, Kiron Skinner’s course, Theories of International Relations, at Carnegie-Mellon devotes roughly 20 percent of its content to WMD issues and the Cold War, including the growth of U.S. and Soviet nuclear

arsenals, the acquisition of fissionable materials, and arms control and disarmament. Similarly, Bruce Cumings’s course at the University of Chicago, War and the Nation State 1792-1945, spends two sessions examining the U.S. decision to use the atomic bomb against Japan, and J. J. Suh’s course at Cornell, International Security, devoted several separate class sessions to deterrence, the Cuban Missile crisis, the role of nuclear weapons after the Cold War, and WMD terrorism.¹⁶

A student might learn the overall importance of WMD in a number of international contexts by taking two or more such general courses. At Vanderbilt, for example, a student could first encounter nuclear weapons and deterrence in the school's introductory course on international politics, which spends two weeks on these issues, and would find further attention devoted to these and other WMD issues in the courses American Foreign Policy, The Causes of War, and Crisis Diplomacy, the last of which, among other issues, examines the two Berlin crises. At the University of Virginia, the sequence could include an introduction to international relations, recent diplomatic history in The Cold War and After, and a closer look at deterrence and nuclear doctrine in Military Force in International Relations. Princeton offers Joanne Gowa's Theories of International Relations (which includes coverage of the nonproliferation regimes) and Anna Satori's course, War and Peace (which includes discussion of deterrence theory, nuclear strategy, and chemical and biological weapons); in addition, undergraduates may seek admission into Michael O'Hanlan's graduate-level course, National Security Policy, which provides one week on proliferation, one on missile defense, one on terrorism, and one on defense "transformation."

However valuable these general courses may be, the specialized courses at 12 of the nation's top 25 national universities, by devoting an entire semester to facets of WMD, offer so much greater depth in addressing these issues that they significantly overshadow what is available even through multiple general courses. Specialized courses include those on arms control and nonproliferation strategies (Princeton, Harvard, Yale, Georgetown, University of Virginia; University of Michigan); the political, social, and cultural impacts of nuclear weapons (Yale, Cornell, Emory); the examination of deterrence theory, warfighting, and the dynamics of proliferation (MIT, Stanford, Johns Hopkins, Emory, University of Virginia); grand strategy (Yale, University of Chicago); the theory and practice of nonproliferation regimes (Johns Hopkins); and WMD terrorism (University of Michigan).

While many general and specialized courses taught at the top 25 national universities included coverage of nuclear, chemical, and biological weapons, as well as advanced delivery systems at some level, a substantial number of courses focused predominantly on nuclear (and related missile) issues, without examining chemical or biological armaments. Indeed only one course, the Politics of Chemical and Biological Warfare and Disarmament, taught by University of Michigan's Susan Wright, was focused solely on the latter issues.¹⁷

Public Universities

The nation's top 25 state-supported public universities (a group that includes 27 schools because of a four-way tie for 24th place)¹⁸ devoted somewhat more attention to WMD issues, overall, than the group of top 25 national universities, but, proportionately, the former group had fewer specialized courses on this subject.

Table 2 summarizes the offerings of general and specialized courses addressing WMD at the top 27 public universities during the 2001-2002 or 2002-2003 academic years. The table indicates that among these schools, 25 (or 93 percent) had two or more courses addressing this topic at some level during the period covering the current and prior academic year. Of these schools, however, only 9 (or 33 percent) included at least one specialized course in their curricula that concentrated on WMD issues. In contrast, 48 percent of the leading national universities offered such specialized courses.

The subject matter of general courses touching on WMD at the leading 27 public universities matched those at the leading 25 national universities, including introductory and advanced courses on international politics, national security, the Cold War, post-Cold War U.S. foreign policy, and international organizations. Examples of general courses touching on WMD for one or more weeks include Kenneth Schultz's course, World Politics, at University of California, Los Angeles, which covers proliferation during the portion of the course addressing salient issues in the post-Cold War world, and Samuel Barkin's course, International Security, at the University of Florida, which devotes a unit to the role of the UN and its subsidiary organizations in promoting WMD disarmament.

As is true at many of the top national universities, a student at a number of the top public universities might learn about the overall importance of WMD in several international contexts by taking two or more such general courses. At the University of California, San Diego, for example, students could be introduced to WMD issues in Barbara Walter's Introduction to Politics and Security, explore regional aspects of WMD proliferation in Randy Willoughby's National and International Security, examine nuclear deterrence and arms control in Branislav Slanchev's National Security Strategy, and delve into U.S.-China strategic and nonproliferation issues in Susan Shirk's U.S.-China Relations. At Ohio State University, similarly, Randy Schweller's The United States in World Politics addresses nuclear weapons and ballistic missile defense; John Mueller's Security Policy During and

TABLE 2
SUMMARY OF GENERAL AND SPECIALIZED UNDERGRADUATE COURSES ADDRESSING WMD AT THE 27 LEADING PUBLIC INSTITUTIONS OF HIGHER EDUCATION

Public University	Rank	Single General Course	Two or More General Courses	Specialized Course	Two or More Specialized Courses
Group I – One or More General Course and One or More Specialized Course					
University of Virginia	2		•		•
University of Michigan	3		•		•
University of California (UC), Los Angeles	4		•		•
UC San Diego	7		•	•	
University of Illinois at Urbana-Champaign	9		•		•
Georgia Institute of Technology	10		•		•
UC Davis	10		•	•	
University of Washington	13		•		•
University of Georgia	18		•	•	
Group II – One or More General Course, No Specialized Courses					
UC Berkeley	1		•		
University of North Carolina	5		•		
College of William & Mary	6		•		
University of Wisconsin	8		•		
Penn State University	14		•		
Texas A&M University*	15		•		
UC Santa Barbara	15		•		
University of Texas, Austin*	15		•		
University of Florida	19		•		
University of Minnesota	19		•		
University of Maryland	21		•		
Ohio State University, Columbus	21		•		
Purdue University, West Lafayette	21		•		
Rutgers University	24		•		
Virginia Institute of Technology	24		•		
University of Delaware	24		•		
Group III Single General Course, No Specialized Courses					
UC Irvine	10	•			
University of Iowa	24	•			

* Texas A&M University and the University of Texas, Austin, both encourage undergraduate students to pursue interests in the field of International Relations and National Security by enrolling in courses offered at their respective graduate schools, the George Bush School of Government and Politics and the Lyndon B. Johnson School of Public Affairs. Neither graduate school offers a course specializing in WMD.

After the Cold War covers the development of nuclear weapons and deterrence theory, missile proliferation, and the relationship between weapons of mass destruction and terrorism; while another course taught by Randy Schweller, *Conflict and Peace*, examines deterrence from a theoretical perspective. Finally, *The Politics of Global Problems* is taught several times a year by varying professors and includes discussions of nuclear weapons and missile developments from an historical perspective in the context of the Cold War.

Specialized courses at the public universities included those on WMD terrorism (University of Michigan), arms control and national security (University of California, Los Angeles; University of Illinois), nuclear weapons history (University of California, Los Angeles; Purdue), deterrence and nuclear strategy (University of Virginia; University of California, San Diego; University of Washington), military and civilian uses of nuclear energy (University of Illinois), regional WMD issues (Georgia Institute of Technology), proliferation (Georgia Institute of Technology; University of Georgia), and nuclear weapon effects (University of California, Davis). As in the case of the national universities, a number of specialized courses focused exclusively on nuclear weapons, but only one specialized course was devoted solely to chemical and biological weapons.¹⁹

Liberal Arts Colleges

The leading 25 national liberal arts colleges appeared to devote less attention to weapons of mass destruction issues than either the leading national universities or the leading public universities.

Table 3 summarizes the offerings of general and specialized courses addressing WMD at the top 25 liberal arts colleges during the 2001-2002 or 2002-2003 academic years. The table examines offerings of individual schools and does not take account of the consortia in which some of them participate, an issue discussed below. The table indicates that among the liberal arts schools, 10 (or 40 percent) had two or more courses addressing WMD at some level during the period covering the current and prior academic year. Of these colleges, 4 schools (or 16 percent) had one specialized course in their curricula that concentrated on WMD issues; none had more than one such course. In contrast, 44 percent of the top national universities offered at least one specialized course on this subject and 30 percent of the leading public universities offered such courses.

A number of the schools in this top 25 liberal arts colleges cohort, however, have grouped together to form consortia that allow students at any member institution to take courses at other member institutions. Thus, although Harvey Mudd College does not, itself, offer any courses relevant to WMD, students there may take WMD-related courses offered by Pomona College and Claremont McKenna College. Swarthmore, Haverford, and Bryn Mawr form another consortium, and Smith, Amherst, and Mount Holyoke participate in a third.²⁰

Table 3a reflects these relationships. It adds Bryn Mawr, Haverford, and Harvey Mudd to Group II (since they are affiliated with schools offering two or more general courses touching on WMD) and also moves Amherst, Mount Holyoke, and Smith into Group II, since, taken together, they offer two or more general courses.

Taking account of the consortia among a number of these schools, Table 3a shows that students at 16 of the 25 schools in this sample, or 64 percent, could take two or more courses that addressed WMD issues at some level. At the top national universities, 88 percent of schools fell into this category, as did 93 percent of the top public universities.

As in Table 3, however, only four schools in the overall group (or 16 percent) offer specialized courses on WMD issues, and no school (or consortium of schools) in the group of 25 offers more than one specialized course. As noted above, 48 percent of the top national universities and 33 percent of schools among the leading public universities offered one or more specialized course.

In terms of subject matter, general courses at the liberal arts schools fell into the same categories as those at the larger institutions, including introductory and advanced courses on international politics, national security, the Cold War, post-Cold War U.S. foreign policy, and international organizations. Examples of general courses touching on WMD for one or more weeks include Kenneth Menkhaus's course at Davidson College, *Contemporary National Security*, which devotes two weeks to WMD issues, addressing deterrence, WMD terrorism, and U.S. missile defenses. Kenneth Rodman's general course at Colby College, *U.S. Foreign Policy: The Cold War*, similarly, devotes several sessions to the U.S.-Soviet nuclear balance.

As at the larger universities, students at a number of the liberal arts colleges in this sample could examine WMD from a number of perspectives by taking multiple general courses on this subject. At Colby College, for

TABLE 3
SUMMARY OF GENERAL AND SPECIALIZED UNDERGRADUATE COURSES ADDRESSING WMD AT THE 25 LEADING U.S. LIBERAL ARTS COLLEGES (WITHOUT CONSORTIA RELATIONSHIPS)

Liberal Arts College	Rank	Single General Course	Two or More General Courses	Specialized Course	Two or More Specialized Courses
Group I – One or More General Course and One or More Specialized Course					
Middlebury*	9		•	•	
Washington & Lee	13		•	•	
Colby	20		•	•	
Hamilton	20		•	•	
Group II – Two or More General Courses, No Specialized Courses					
Swarthmore**	2		•		
Williams	3		•		
Pomona***	5		•		
Davidson	10		•		
Wesleyan (Connecticut)	11		•		
Claremont-McKenna***	17		•		
Group III Single General Course, No Specialized Courses					
Amherst ****	1	•			
Wellesley	4	•			
Bowdoin	5	•			
Carleton	5	•			
Haverford**	5	•			
Grinnell	11	•			
Smith****	14	•			
Vassar	14	•			
Colgate	17	•			
Bates	22	•			
Oberlin	22	•			
Mount Holyoke****	24	•			
Trinity	24	•			
Group IV – No General or Specialized Courses					
Harvey Mudd***	14				
Bryn Mawr**	17				

* Specialized course offered as freshman seminar, for single year ** Courses at Bryn Mawr, Haverford, and Swarthmore open to students from all three schools *** Courses at Claremont-McKenna College, Harvey Mudd College, and Pomona College open to students from all three schools (and from Scripps College) **** Students from Amherst, Mount Holyoke, and Smith may take courses at any of the three schools (as well as at Hampshire College and University of Massachusetts, Amherst). The consortia relationships are discussed in the text.

example, WMD issues are addressed in the courses U.S. Foreign Policy: The Cold War, U.S. Foreign Policy: After the Cold War, and Multilateralism and U.S. Foreign Policy. All are taught by Kenneth Rodman. A student at Pomona could take Paul Kapur’s Introduction to International Politics at Claremont McKenna, Edward Haley’s

Diplomacy and Military Power at Claremont McKenna, and David Elliot’s International Relations of Asia at Pomona to learn of nuclear dynamics in that region.

The handful of specialized courses offered in this group include Colby College professor Paul Josephson’s Nuclear Madness, covering the Manhattan Project, the

TABLE 3A
SUMMARY OF GENERAL AND SPECIALIZED UNDERGRADUATE COURSES ADDRESSING WMD AT THE 25 LEADING U.S. LIBERAL ARTS COLLEGES (WITH CONSORTIA RELATIONSHIPS)

Liberal Arts College	Rank	Single General Course	Two or More General Courses	Specialized Course	Two or More Specialized Courses
Group I – One or More General Course and One or More Specialized Course					
Middlebury*	9		•	•	
Washington & Lee	13		•	•	
Colby	20		•	•	
Hamilton	20		•	•	
Group II – Two or More General Courses, No Specialized Courses					
Amherst****	1		•		
Swarthmore**	2		•		
Williams	3		•		
Pomona***	5		•		
Haverford**	5		•		
Davidson	10		•		
Wesleyan (Connecticut)	11		•		
Smith****	14		•		
Harvey Mudd*	14		•		
Bryn Mawr**	17		•		
Claremont McKenna***	17		•		
Mount Holyoke****	24		•		
Group III Single General Course, No Specialized Courses					
Wellesley	4	•			
Bowdoin	5	•			
Carleton	5	•			
Grinnell	11	•			
Vassar	14	•			
Colgate	17	•			
Bates	22	•			
Oberlin	22	•			
Trinity	24	•			
Group IV – No General or Specialized Courses (No members)					

* Specialized course offered as freshman seminar, for single year ** Courses at Bryn Mawr, Haverford, and Swarthmore open to students from all three schools *** Courses at Claremont McKenna College, Harvey Mudd College, and Pomona College open to students from all three schools (and from Scripps College) **** Students from Amherst, Mount Holyoke, and Smith may take courses at any of the three schools (as well as at Hampshire College and University of Massachusetts, Amherst).

U.S.-Soviet arms race, and nuclear power, among other issues; Hamilton College visiting professor Carlos Yordán's War and Politics, examining, *inter alia*, nuclear issues in Northeast and South Asia; Middlebury professor Robert Cluss's freshman seminar, Science Demonized: Chemical and Biological Warfare; and Washington and Lee profes-

sor Robert Strong's course on National Security Policy, which has twice focused on proliferation issues. (It is uncertain whether the Middlebury and Hamilton courses will become part of these schools' continuing offerings, and the Washington and Lee course, which changes its orientation year-by-year, is expected to shift to terrorism

in its next cycle.) Robert Cluss's course at Middlebury, it may be noted, is one of the very few courses in this survey to concentrate on chemical and biological weapons.

Military Academies

A final group of undergraduate institutions of relevance are the four U.S. military service academies: the U.S. Military Academy, West Point, New York; the U.S. Naval Academy, Annapolis, Maryland; the U.S. Air Force Academy, Colorado Springs, Colorado; and the U.S. Coast Guard Academy, New London, Connecticut. Given their unique missions, the curricula of the academies concentrate heavily on international security and military science. Within this context, each of the schools has offered a general course touching WMD issues and a specialized course on these questions, either in the current or immediately past academic years. At West Point, Lieutenant Colonel Cindy Jebb's course, International Security, addresses these issues in depth. At Annapolis, visiting professor Jack Mendelsohn has taught Weapons of Mass Destruction: Proliferation, Non-Proliferation, and Counter-Proliferation. At Colorado Springs, Charles Krupnik has taught Proliferation of Weapons of Mass Destruction. The Coast Guard Academy's America in the Nuclear Age is another specialized course. Thus, not surprisingly, 100 percent of the schools in this category cover this issue in depth. No school, however, offered more than one specialized course on WMD. Table 4 summarizes the proportion of schools in each of the foregoing categories offering two or more courses (general or spe-

cialized) on WMD issues and the proportion of schools offering specialized courses.

Course Content

Courses addressing WMD issues at all groups of schools usually reflected one of five major organizational models. A number of professors built the semester's curriculum around WMD technologies, examining their histories; their impact on global, regional, and domestic politics; the dangers they pose as threats to human life; and/or mechanisms for controlling or managing their use to reduce or counter those dangers. Courses in this group included Nuclear Weapons (Dan Reiter, Emory; Michael Intrilligator, University of California, Los Angeles); Nuclear America (Daniel Kevles, Yale), Nuclear Revolution (Mark Sheetz, Yale), and the Politics of Chemical and Biological Warfare and Disarmament (Susan Wright, University of Michigan).

A second group of courses took an explicitly U.S. perspective, concentrating the role of WMD (in this setting, nuclear weapons) in U.S. national security, how the United States should integrate such weapons in future force planning, and how it can most effectively protect itself from emerging WMD threats. Courses in this group included, American National Security Policy (Stephen Meyer, MIT; Barbara Walter, University of California, San Diego); and American Foreign Policy (Richard Stoll, Rice; Kenneth Menkhaus, Davidson; and Paul Kapur, Claremont McKenna).

TABLE 4
SUMMARY OF PROPORTION OF SCHOOLS OFFERING TWO OR MORE COURSES (GENERAL OR SPECIALIZED) ON WMD AND PROPORTION OF SCHOOLS OFFERING SPECIALIZED COURSES ON WMD

Type of Institution	Two or More Courses (General + Specialized)	One or More Specialized Course	Two or More Specialized Courses
Top 25 National Universities	88%	48%	24%
Top 27 Public Universities	93%	33%	22%
Top 25 Liberal Arts Colleges (individual schools)	40%	16%	0%
Top 25 Liberal Arts Colleges (consortia)	64%	16%	0%
Military Academies (4)	100%	100%	0%

A third cluster of courses approached the subject from a more global or theoretical perspective, scrutinizing the impact of weapons of mass destruction on interstate relations and their role in national security policy, generally. This group included such courses as Global Security After the Cold War (Duncan Snidal, University of Chicago), International Security (Peter Feaver, Duke; Nina Tannenwald and Terence Hopmann, Brown; Robert Paarlberg, Wellesley), National Security (Michael O'Hanlon, Princeton), International Politics (Daryl Press, Dartmouth; Erik Gartzke, Columbia), and courses focused on strategy (Robert Pape, Chicago; Richard Betts, Columbia; Paul Bracken, Yale; Branislav Slanchev, University of California, San Diego) and international conflict (John Mearsheimer, University of Chicago; Christopher Way, Cornell; Dale Copeland, University of Virginia).

A fourth set of courses addressed WMD in the context of international organizations—for example, the United Nations and International Security (James Sutterlin, Yale), International Organizations and World Politics (Nina Tannenwald, Brown), International Institutions (Robert Mortimer, Haverford; Samuel Barkin, University of Florida), and Multilateralism and U.S. Foreign Policy (Kenneth Rodman, Colby).

Finally, a handful of courses—including Asian Wars of the 20th Century (Bruce Cumings, University of Chicago) and Contemporary International Relations of Asia (David Elliot, Pomona)—came to weapons of mass destruction issues through consideration of regional security relations or through consideration of another specialized area, terrorism (Raymond Tanter, University of Chicago).

Philosophically, the great majority of generalized and specialized courses, taken together, took a middle-ground position, neither condemning nor espousing WMD, but, rather, tending to help students understand the nature and history of these weapons, the dynamics that lead nations to acquire them, the mechanisms that restrain these propensities, and the means nations use to address WMD threats posed by others. Simply put, the courses tended more toward presenting WMD as a phenomenon of international relations to be comprehended and analyzed, rather than as a problem or threat to be mitigated.

After reviewing a wide selection of syllabi as an advisor to this survey, University of Maryland professor George Quester commented in a memorandum that a handful of courses “seemed to be premised on an assumption that the entire history of nuclear weapons has been a tragedy and a mistake.” These few exceptions aside, he contin-

ued, the courses had “very comparable breakouts of the dimensions of the world’s remaining military problems, and the risks of proliferation, but assigned many different readings.” He went on to note that “most of us teaching on this subject are on the same wavelength.”

University of Chicago professor Robert Pape echoed this judgment in an interview conducted with the *Nonproliferation Review* during the course of the survey. He noted that teaching in the field today is “more focused on substantive issues and less on the politics of the professors,” with courses frequently seeking to show the debates on issues, rather than inculcating a particular point of view.²¹ Instructors now emerging as full professors, he pointed out, were mostly trained since the early 1980s and represent a new group, which has tended to adopt this mode of thinking. Their views are not identical, he stressed, but they have “a common approach” that contrasts with that of some of their predecessors, whose courses were more likely to reflect political agendas. He characterized the new approach as creating an “open architecture,” i.e., giving students the intellectual tools to reach their own conclusions.

In a similar vein, Yale professor Mark Sheetz commented that his specialized course, *The Nuclear Revolution*, “examines the political impact of nuclear weapons and therefore does not focus directly on concerns about the proliferation of weapons of mass destruction. It does, of course, treat issues of proliferation and missile defense, but without any particular agenda.” His Yale colleague, Paul Bracken echoed this point, noting that his general course, *Strategy, Technology, and War*, “does not accept nonproliferation or arms control as its framework, but examines the issue of WMD from the perspective of grand strategy.”²²

An example of presenting various sides of an issue can be seen in Harvard professor Andrew Kydd’s course, *Arms and Arms Control*, in which a unit on arms control theory contrasts readings championing arms control from Thomas Schelling and Morton Halperin’s classic, *Strategy and Arms Control* (New York: The Twentieth Century Fund, 1961) with those expressing skepticism from Colin Gray’s *House of Cards* (Ithaca: Cornell University Press, 1992). Another unit on superpower arms control contrasts an article on missile defense by proponent Keith Payne with those of a more cautious Steven E. Miller, among others. The latter subject is also presented in debate format in courses at MIT, Stanford, and Johns Hopkins. Tomoharu Nishino, at the University of Texas, Austin, similarly notes in his syllabus for *Issues in Post Cold War*

American Foreign Policy, “For each lecture, I typically assign two articles representing opposing views on a particular issue.” His course includes the sessions “The Cold War,” “Responding to Unconventional Threats,” and “Proliferation.” The widespread use in both general and specialized courses of *The Spread of Nuclear Weapons: A Debate* (New York: W.W. Norton, 1995) by Scott D. Sagan and Kenneth N. Waltz also exemplifies this trend.

In all, 27 colleges and universities of the 78 surveyed, or a total of 35 percent, offered specialized courses, and taking all of these institutions into account, 41 such courses were identified. If the military academies are excluded, then 23 schools out of 74 (or 31 percent) had such courses. The institutions, the titles of the specialized courses, and the professors teaching them are shown in Appendix I. Many syllabi for these courses can be found at <<http://www.cns.miis.edu/pubs/npr/survey.htm>>. Although their specific subject matters differ, all of these courses provide a concentrated introduction to a range of WMD issues. It is not possible within the space of this article to undertake a detailed analytical review of syllabi for all these courses. To help the reader appreciate the overall direction of instruction, however, Table 5 provides a listing of the topics covered, in weekly units, from syllabi of four representative specialized courses.

The courses summarized in Table 5 reflect a number of the trends noted above, in particular the lower level of attention to WMD other than nuclear weapons. It may be noted, however, that completed questionnaires received by the *Nonproliferation Review* indicated that chemical and biological warfare were among the subjects covered at some level in roughly half of the specialized courses. Separately, three of the four specialized courses summarized in Table 5 included issues of current concern regarding the *proliferation* of weapons of mass destruction, indicating that while this topic was not infrequently included in specialized courses, attention to this issue was not universal, and depended on the specific subject of the course. As mentioned in the notes to the introduction to this article, only a half dozen specialized courses at non-military undergraduate institutions concentrated specifically on the issue of proliferation.²³ At the four military academies surveyed, two of four courses specializing in weapons of mass destruction were concentrated on the proliferation/nonproliferation issue, suggesting a greater level of attention to this dimension of WMD at these institutions than elsewhere.

WMD terrorism is listed only once in the four courses summarized in Table 5. Completed questionnaires received

by the *Nonproliferation Review* for the 41 specialized courses, however, indicate that the topic is covered at some level in roughly half of these courses.

Teaching Methods

The vast majority of general and specialized courses used traditional approaches for teaching their subject matter—lectures and discussion sessions, research papers, and written examinations. Several courses introduced innovative classroom methods, however.

Dean Robert Gallucci of the Walsh School of Foreign Service, for example, gives each of the students in his specialized seminar, International Security and the Spread of Weapons of Mass Destruction, an oral final exam, believing it is important for students to learn how to present and defend their views in person, as well as in written products.

Seeking to impart an approach to thinking about foreign affairs, as well as familiarity with specific events, Davidson College’s Louis Ortmyer uses the Pew Case Histories in his general course, Contemporary National Security. Covering a case each week of the semester to examine a specific foreign policy issue, his course includes case histories on the Comprehensive Nuclear Test Ban Treaty, the START negotiations, the role of then Representative Les Aspin in the decision to deploy the MX missile, and national missile defense.²⁴

Visiting scholar Theodore Hirsch in his course at Yale, The New Nuclear Arms Control, found student debates an effective way to stimulate discussion and encourage students to master subject matter. The approach was also used by Daniel Deudney in Global Security and Politics at Johns Hopkins University. He divided his class into teams, each of which was to prepare a polished PowerPoint briefing on one side of an issue (backed up by 10-page research papers forming an integrated briefing document). At the end of each course module, students debated issues using National Forensic League rules, with scoring done by other classmates. Debates are also used by Susan Wright in her course at the University of Michigan, The Politics of Chemical and Biological Weapons, and by Georgia Institute of Technology’s Adam Stulberg, in The Problem of Proliferation.

Student presentations were another tool used by a number of instructors. These included Clifford Singer in his course, Nuclear Weapons, Nuclear War, and Arms Control, at the University of Illinois, Urbana-Champaign; Carlos Yordán, in War and Politics at Hamilton College; Susan Peterson in her course, International Security, at

TABLE 5
WEEKLY SUBJECTS OF REPRESENTATIVE SPECIALIZED WMD COURSES

Week	WMD – Proliferation, Non-Proliferation, and Counter-Proliferation	National Security in the Nuclear Age	Arms Control and International Security	Nuclear Weapons
	Jack Mendelsohn US. Naval Academy	Christopher Ball Johns Hopkins University	Greg Rasumssen U. of Cal., Los Angeles	Dan Reiter Emory University
1	I. The Non-Proliferating Regime: Nuclear Weapons	1945 & the Nuclear Revolution: Changing Ideas of Security	Course Introduction	Overview of Course
2	The Nonproliferation Treaty Regime	Nuclear Strategy During the Cold War Theory of Nuclear Strategy	I. What Role Do Weapons Play in Causing War? Early Nuclear Developments; Coercive Diplomacy	History of the Manhattan Project: the Dawn of Nuclear Physics, From Radiation to First Conceptions of a Chain Reaction
3	Nuclear Weapons Testing/CTBT	Nuclear Strategy in Practice	Security Dilemma: Crisis Instability; Cold War (1945-1962)	History of the Manhattan Project: From Neutrons to Los Alamos
4	The Chemical Weapons Convention	The Cuban Missile Crisis	Mutual Assured Destruction; Cold War 1962-1973	History of the Manhattan Project: Oak Ridge to the Enola Gay
5	Biological Weapons and the BWC	A World Gone MAD?	Exam	Should We Have Dropped the Bomb?
6	The Fissile Material Cut-Off; Missile Technology Control Regime	Crisis Stability, Strategic Stability, and Defense Foregone	Horizontal Proliferation: Potential Consequences	The Political Revolution of Nuclear Weapons
7	The Missile Threat	Endgames: INF and the START Process	II. What Role Do Arms Control Agreements Play in Influencing Weaponry? Arms Control Theory; The Long Thaw (1968-2002)	American Culture in the Early Nuclear Age

the College of William and Mary; and Robert Cluss in his course at Middlebury College, *Science Demonized: Biological and Chemical Warfare*. A number of professors also made use of visiting lecturers and videos.

Simulations were also employed at several schools. One of the most advanced is that used by Paul Bracken of Yale in his course, *Strategy and the Technology of War*. Using highly sophisticated software he has designed with students over the years, Bracken divides his class, numbering 250 students, into country teams to participate in

a gaming simulation involving strategic decision making (including military budget choices) over a 20- to 30-year timeframe. Students are graded on the basis of their frequency of play, their involvement in the game, and through a final exam. Simulations are also in use in Lieutenant Colonel Cindy Jebb's *International Security* course at the U.S. Military Academy and in Scott Sagan's course at Stanford, *International Security in a Changing World*.

Yale professor James Sutterlin has students use a unique set of research materials in studying the efforts of

TABLE 5 (CONTINUED)
WEEKLY SUBJECTS OF REPRESENTATIVE SPECIALIZED WMD COURSES

Week	WMD – Proliferation, Non-Proliferation, and Counter-Proliferation	National Security in the Nuclear Age	Arms Control and International Security	Nuclear Weapons
	Jack Mendelsohn US. Naval Academy	Christopher Ball Johns Hopkins University	Greg Rasumssen U. of Cal., Los Angeles	Dan Reiter Emory University
8	II. The Threat of Proliferation: Iraq, DPRK, India, Pakistan	The Nuclear Age After the Cold War Nuclear Ethics	Non-Proliferation Efforts (1945-1983) – Why Proliferation?	Brinkmanship
9	South Africa; Leakage from Russia	A New Nuclear Era?	Case Studies on the Issues of Arms Control Effectiveness	(Spring Break)
10	WMD Terrorism	Theories of Proliferation	Exam	The Cuban Missile Crisis
11	III. Counter-Proliferation Options Diplomacy	Underneath the Nonproliferation Treaty Regime	III. What Factors Promote Effective Arms Control? Domestic Sources of Arms Control; Global Initiatives (1983-2002)	The Hydrogen Bomb and the Beginnings of the Nuclear Arms Race
12	Deterrence and Counter-Proliferation	U.S. Force Posture and Nuclear Use	International Sources; Regional Conflicts and Arms Control	Dynamics of the Arms Race
13	Defenses and Missile Defense	Test Bans and Abolition	Missile Defense and Proliferation: Great Power Cooperation & Hegemony	Ethics and Norms
14	Intelligence and Strategic Warning	Do We Have Fear Rogue States?	Exam	Miscellaneous: Accidents and the Rosenbergs
15	Export Controls and Inspections	The National Missile Defense Debate		

the UN Special Commission to disarm Iraq, a component of his course on the UN and the Maintenance of International Security. The materials are oral histories provided by former UN inspectors in Iraq, which Sutterlin has helped collect as part of a larger UN oral history project. Finally, Michael Krepon, in his course on Nuclear Weapons, Missile Defense, and Arms Control at the University of Virginia, has a visiting lecturer work with students on nuclear targeting exercises and also brings these students to Washington, DC, for a day of meetings with defense specialists and practitioners.

ANALYSIS AND TRENDS

As suggested at the outset of this article, given the importance of emerging WMD threats to the United States and their prominence in post-Cold War international relations, it is surprising that more than two-thirds of the country’s leading non-military colleges and universities have not included specialized courses on WMD as part of their curricula.

Within this overall state of affairs, moreover, there are a number of instances where the failure of specific

institutions to meet this challenge evokes particular puzzlement. The University of California, Berkeley, which is ranked by *U.S. News and World Report* as the country's premier public university, has no specialized courses on WMD. This gap is especially noteworthy when it is recognized that the University of California operates the nation's two nuclear weapon design laboratories (Los Alamos National Laboratory and Livermore National Laboratory) and that three of Berkeley's sister schools in the University of California system—the universities at Davis, Los Angeles, and San Diego—do offer specialized courses on WMD. Columbia University, which boasts a number of highly prominent WMD specialists on its faculty, similarly lacks such a specialized course.

No less surprising is that, among the *U.S. News and World Report* rankings, the country's leading technical university, California Institute of Technology, does not appear to offer a single specialized or non-specialized course on weapons of mass destruction, and another prominent technical university, Carnegie Mellon, does not offer any specialized courses on this subject. Among the liberal arts colleges, the top *eight* schools—Amherst, Swarthmore, Williams, Wellesley, Bowdoin, Carleton, Haverford, and Pomona—also do not offer a specialized course on weapons of mass destruction.

Based in interviews with numerous professors at a range of institutions, several factors appear to have contributed to this situation. One frequently cited element was lack of student interest during the 1990s. Concerns about a catastrophic nuclear exchange between the superpowers had long motivated student interest in courses on nuclear arms, but with the end of the Cold War, these concerns abated. Instead, students focused on international affairs turned their attention to the potential excesses of globalization—child labor, sweatshop working conditions, and environmental degradation. Columbia's Richard Betts, for example, noted that "there is less demand than before," for courses on weapons of mass destruction, and that his course, *War, Peace, and Strategy*, devotes only three weeks to weapons of mass destruction (principally nuclear arms), "not like when they were the focus."

Pomona professor David Elliott commented on the phenomena at his school. Noting that in the mid-1980s Leo Flynn took over teaching Pomona's National Security and Arms Control course, he stated, "As the Cold War ended, Leo's interest waned (as did that of our students), and he eventually dropped the national security and arms control course. [This] may be typical at small colleges.

National Security and Arms Control courses tend to be taught (if at all) by people who have only a tangential interest in the subject and, therefore, at the slightest sign of waning student interest these courses are likely to disappear. Throughout the 1990s student interest in IR [international relations] in general dropped off considerably, as they all prepared to plunge into the go-go economy."²⁵ Elliott's comment concerning the lure of employment in California's high-tech industries may also help explain why courses on weapons of mass destruction are not found at California Institute of Technology, with its obvious focus on technical training.

Receding student interest in WMD issues was also observed at the University of Wisconsin. Asked who was teaching Pol. Sci. 371, *Nuclear Weapons and World Politics*, an entry in the department's online course listings, an aide at the department's office stated, "Oh, that course has not been taught since 1996, when David Tarr retired."

In this environment, even Hampshire College professor Michael Klare, who teaches students from Amherst, Mount Holyoke, and Smith, and was a well-known champion during the 1980s of restraints on nuclear weaponry, turned his attention predominantly to the new agenda during the subsequent decade.²⁶

In the wake of the events September 11, 2001, the war on terrorism, and the potential conflict with Iraq, however, student interests are changing, and there appears to be growing demand for instruction on security issues. At the University of Illinois, enrollment in Jeremiah Sullivan's course *Nuclear Weapons, Nuclear War, and Arms Control* will double between fall 2002 and spring 2003, from 50 to 100 students (the limit set because of the size of the room where it is to be taught); in the 1990s, he noted, participation was only "in the high 20s to low 30s."²⁷ At the University of California, Davis, similarly, 320 students are enrolled in *Introduction to International Security*. At Georgetown, Audrey Cronin's course, *Terrorism*, is in such demand that it is being taught three times a year. At Yale, Mary Habeck's course, *The Military, War, and Society in the United States: 1865 to the Present*, which includes several sessions on nuclear weapons, is among the most popular courses on the campus. At the University of California, Berkeley, finally, at the request of the chancellor's office to respond to September 11, 2001, Harry Kreisler organized a course on problems of U.S. foreign policy, which has had a very sizeable enrollment and is to be offered again in 2003.

Brian Pollins of Ohio State suggested that new budgetary factors may increase responsiveness to such student

interest at a number of universities. Ohio State, he noted, is switching to a budgetary system that will make the curriculum entirely demand driven.²⁸

Responding to renewed demand, Amherst professor Ronald Tiersky will launch the course International Security at the college in the 2003-2004 academic year, and Michael Klare has recently received a grant to develop a course for early introduction on weapons of mass destruction in the post-Cold War era. Harold Feiveson's Task Force on Weapons of Mass Destruction Proliferation at Princeton also reflects this trend. Mark Wheelis at the University of California, Davis, finally, is also preparing a course on chemical and biological weapons to be offered in the fall of 2003.

Renewed demand may be difficult to meet at many institutions, however, because of the second factor that has contributed to the absence of specialized courses on WMD at the nation's top schools: the eclipse of policy studies in most departments of political science during the 1990s in favor of the theoretical and quantitative aspects of the discipline. One specific effect of the trend was to reduce the attention to security studies at U.S. colleges and universities. University of Chicago professor John Mearsheimer, one of America's most respected national security scholars, referred to the trend as a "disgrace" and a "national problem." "One should not underestimate," he stressed, "how security specialists were isolated in the 1990s and marginalized as departments became infatuated with international political economy and rational choice theory."²⁹

A scholar at Berkeley provided a detailed characterization of how this trend has affected the nation's leading public university:

Berkeley has indeed been weak for many years now on U.S. foreign policy and current problems of international relations generally—and on security issues (including but not limited to proliferation issues) particularly. Every university has its own culture, as you know. One aspect of Berkeley's has been, for better or worse... that it has had very few regular faculty working on policy issues generally, with the exception of people working in public administration at the Goldman School. There's a ton of stuff that goes on here relating to security issues in the way of talks, conferences, visiting researchers, etc., some organized by the Institute of International Studies and some organized by area centers, but very little teaching by tenure-ladder faculty. The source of most of the problem is the need of our Political Science Department to respond to trends in the discipline, where policy studies in general and security studies in

particular have long been out of fashion. As a result, the Department right now doesn't have anyone who specializes in security, with the partial exception of Steve Weber, and only two professors who are in international relations. An IR search last year came to naught, for various reasons. When they do make an IR appointment, given current trends in political science, the person is likely to be a "theorist" who does formal modeling of one kind or another, and not a security specialist or someone with considerable empirical knowledge or experience.³⁰

This trend was also highlighted recently by the *New York Times*, in a lengthy story that detailed the decade-long decline within departments of political science of regional studies specialists—including those studying nuclear flashpoints in Asia—in favor of theoretical modelers.³¹

A final trend that has reduced interest in specialized courses on WMD, some argue, is that many liberal arts colleges and a number of universities, because of their left-leaning political culture, disfavor courses on national security issues. One survey interview subject opined that University of California, Berkeley, retained its antipathy to defense issues, acquired during the anti-war turmoil of the 1960s. Another commenter argued that similar political sentiments affected course orientation at many liberal arts colleges—"the center of gravity is very left"—making them inhospitable to instruction on the WMD threat and means for addressing it. Some have also suggested that, unlike large universities whose political science departments may have tens of faculty members, such departments at the liberal arts colleges are so much smaller that the schools simply lack the faculty resources to cover all political science topics of potential importance.

It is difficult to assess the validity of these views. It may be noted, for example, that courses on nuclear weapons were a common feature of the curricula of liberal arts colleges through the 1980s, when students were eager to understand these issues—in part, to encourage the superpowers to restrain their nuclear arsenals. Moreover, four liberal arts colleges do, in fact, offer specialized courses on WMD, suggesting that size is no bar to covering this subject area. Nor is there any reason that courses on WMD today might not focus on an agenda in line with the supposed political leanings of these institutions—concentrating on the humanitarian dangers these weapons pose and on multilateral and diplomatic means for reducing these threats as an alternative to military responses. Similarly, these schools appear fully able to address a wide range of

specialized subjects in their curricula. Pomona, for example, has political science courses on Japanese politics and on the work of Hannah Arendt, and Smith's Government Department course list includes the Politics of International Tourism and Algeria in the International System. Thus it would seem that past student and faculty preferences, rather than political orientation or lack of resources, are more important factors influencing the WMD instruction gap at these schools.

PROSPECTS AND CONCLUSIONS

As the decade unfolds, the dangers posed by weapons of mass destruction in the hands of nations and terrorists loom as increasingly visible and threatening dimensions of U.S. national security specifically and of international relations, more generally. This reality, heightened by the tragedy of September 11, 2001, appears to be stimulating growing interest on the part of undergraduate students in learning about WMD and means for combating the diverse threats they present.

As this survey has shown, however, at more than two-thirds (51 out of 74) of the leading U.S. undergraduate institutions (apart from the military academies), there is little instruction focused specifically on these issues. As demand for such instruction grows, this situation is likely to change. Given the orientation of the current faculty at many of these institutions, however, it is likely that a lag of some years will ensue before new hires lead to the availability of courses commensurate with increasing student interest—and, more generally, with the needs of the nation.

How significant is this lack of attention to weapons of mass destruction at so many prominent undergraduate institutions? First, it is worth recalling that this survey has examined the country's *leading* schools. To be sure, one cannot extrapolate directly from this sample to the level of attention given WMD at other undergraduate institutions. Nonetheless, it is probably fair to say that the example set by the leading schools, at some level, influences the behavior of others, especially when it is recognized that the leading schools set the terms of reference for faculty achievement, as newcomers strive for recognition and advancement. Thus, the relative inattention to WMD seen in the schools in the survey sample may well reflect a more widespread trend.

In many respects, education is an intangible good, helping to create a more informed citizenry that is better able to participate in the U.S. democratic process and help define how this country engages with the global community. In this context, a fundamental role of undergraduate

institutions is to help students appreciate what is important in the world they are entering and to understand, at some level, the forces that are shaping this world. What message does a student receive if, in examining a listing of political science courses, he never observes a reference to the instruments at issue here—weapons of mass destruction—that are playing so prominent a role in international affairs today, and which, it is feared, may play a still larger role tomorrow?

More practically, after September 11, 2001, the United States has begun a transformation in its thinking about its own security, a new vision informed by such concepts as the “clash of civilizations,” threats from non-state actors, and asymmetric warfare that targets our vulnerabilities. The magnitude of the transformation is well symbolized by the creation of the Department of Homeland Security, now recognized as the most far-reaching reorganization of the U.S. government since the creation of the Department of Defense in 1947. In parallel, the United States is investing tens of billions of dollars—and preparing for a major war—to meet the threats it now confronts, most particularly from WMD. As was true after the Soviet Union's launch of the *Sputnik* satellite galvanized a massive effort to enhance U.S. scientific capabilities, an initiative that included significant new funds for science education, the United States must now anticipate the need for large numbers of new, often highly trained personnel to meet the challenges of this decade and beyond.

By definition, undergraduate education will not create the new generation of scholars, diplomats, program managers, and other professionals needed to address this task. But undergraduate institutions can set the stage, stimulating students to move into careers in this sphere by introducing them to historical reference points, current developments, and new thinking in the field, providing mentors, and—perhaps most significantly—by validating the importance of this work to America's future.

Against this background, the need for greater attention to weapons of mass destruction issues in undergraduate curricula is clear. Evidence suggests that student interest is growing, and already several new courses are entering undergraduate catalogues. How well and how rapidly academia will respond to this urgent need remains to be seen. The 2002 *Nonproliferation Review* Survey of Nonproliferation Education will provide a baseline for measuring progress.

APPENDIX 1

UNDERGRADUATE COURSES AT LEADING U.S. COLLEGES AND UNIVERSITIES THAT DEVOTE 75 PERCENT OR MORE OF THEIR CONTENT TO WMD AND MEANS FOR COMBATTING THEIR PROLIFERATION AND USE

School (Rank)	Instructor	Course Title
Top 25 National Universities		
Princeton University (1)	Frank von Hippel, Zia Mian, Ron Nelson	Protection Against WMD
Princeton University	Harold Feiveson	Task Force on Proliferation of WMD*
Harvard University (2)	Andrew Kydd	Arms and Arms Control
Yale University (3)	Paul Bracken	Strategy, Technology, and War
Yale University	Daniel Kevles	Nuclear America
Yale University	Mark Sheetz	The Nuclear Revolution
Yale University	Theodore Hirsch	The New Nuclear Arms Control*
Massachusetts Institute of Technology (MIT) (5)	Theodore Postol	Analysis of Strategic Nuclear Forces
MIT	Theodore Postol	Tech. & Policy of Weapons Systems
MIT	Barry Posen and Theodore Postol	U.S. Military Power
Stanford University (6)	Barton Bernstein	Atomic Bomb in Policy and History
Stanford University	David Holloway	Challenge of Nuclear Weapons
Stanford University	Scott Sagan, Coit Blacker, William Perry	International Security in a Changing World
University of Pennsylvania (7)	Robert Kane	Living with the Bomb
Cornell University (14)	Michael Aaron Dennis	Atomic Consequences
Johns Hopkins University (16)	Steven David	Nuclear Security in the Nuclear Age
Emory University (18)	Dan Reiter	Nuclear Weapons
University of Virginia (21)	John Redick	Nuclear Nonproliferation & International Relations
University of Virginia	Michael Krepon	Nuclear Weapons, Missile Defense, and Arms Control
Georgetown University (23)	Lawrence Scheinman, Allan Krass	Nuclear Proliferation
University of Michigan (25)	Raymond Tanter	Terrorism and Proliferation
University of Michigan	Susan Wright	Politics of Chemical and Biological Warfare and Disarmament

APPENDIX 1 (CONTINUED)**UNDERGRADUATE COURSES AT LEADING U.S. COLLEGES AND UNIVERSITIES THAT DEVOTE 75 PERCENT OR MORE OF THEIR CONTENT TO WMD AND MEANS FOR COMBATTING THEIR PROLIFERATION AND USE**

School (Rank)	Instructor	Course Title
Top 25 Public Universities		
University of Virginia (2)	John Redick	Nuclear Nonproliferation & International Relations
University of Virginia	Michael Krepon	Nuclear Weapons, Missile Defense, and Arms Control
University of Michigan (3)	Raymond Tanter	Terrorism and Proliferation
University of Michigan	Susan Wright	Politics of Chemical and Biological Warfare and Disarmament
University of California (UC), Los Angeles (4)	Michael Intrilligator	Nuclear Weapons: The Critical Decisions
UC Los Angeles	Gregory Rasmussen	Arms Control and international Security
UC San Diego (7)	Philip Roedeer	National Security Strategy
University of Illinois at Urbana-Champaign (8)	Clifford Singer	Military and Civilian Uses of Nuclear Energy
University of Illinois at Urbana-Champaign	Jeremiah Sullivan	Nuclear Weapons, Nuclear War, and Arms Control
Georgia Institute of Technology (10)	Adam Stulberg	The Problem of Proliferation
Georgia Institute of Technology	John Endicott	Special Topics: Korean Security Issues*
UC Davis (10)	Richard Freeman	Science and Technology of Nuclear Arms Effects and Control
University of Washington (13)	John Mercer	War and Deterrence
University of Washington	John Mercer	Int'l War and Deterrence
University of Georgia (18)	Nathan Bush	Emerging Threats in International Security

APPENDIX 1 (CONTINUED)

UNDERGRADUATE COURSES AT LEADING U.S. COLLEGES AND UNIVERSITIES THAT DEVOTE 75 PERCENT OR MORE OF THEIR CONTENT TO WMD AND MEANS FOR COMBATTING THEIR PROLIFERATION AND USE

School (Rank)	Instructor	Course Title
Top 25 Liberal Arts Colleges		
Middlebury College (9)	Robert Cluss	Science Demonized: Biological and Chemical Warfare*
Washington and Lee College (13)	Robert Strong	National Security Policy
Colby College (20)	Paul Josephson	Nuclear Madness
Hamilton College (20)	Carlos Yordán	War and Politics*
U.S. Armed Forces Academies		
U.S. Naval Academy	Jack Mendelsohn	WMD: Proliferation, Non-Proliferation and Counter-Proliferation
U.S. Military Academy	Graham Undercoffer	International Security
U.S. Air Force Academy	Charles Krupnik	Proliferation of Weapons of Mass Destruction
U.S. Coast Guard Academy	Gary Donato	America in the Nuclear Age

Rankings based on *U.S. News and World Report* (2001). Twenty-seven schools listed in Top 25 Public Universities because of four-way tie for 24th place. The University of California, Berkeley, University of Michigan, and University of Virginia appear on both the list of leading U.S. national universities and leading U.S. public universities.

* Special courses that may not be repeated.

¹ The survey and the analysis of results presented here were conducted by a team of specialists led by Leonard S. Spector, Director of the Washington, DC, Office of the Monterey Institute Center for Nonproliferation Studies. An initial study, involving programs at 20 undergraduate and graduate schools, which became the basis for the more extensive review presented here, was prepared for the Nuclear Threat Initiative by Theodore M. Hirsch, who continued to serve as special advisor to the project. At the time, Mr. Hirsch was Visiting Scholar at Yale Law School. He currently serves as Attorney-Advisor, Office of the Legal Advisor, U.S. Department of State. Nicole Lawhorn, Research Assistant, CNS Washington, DC, contributed significantly to the survey design, prepared the survey questionnaire used for this study, and constructed the web presentation of survey results. Eduardo Fujii, Programmer-Analyst, CNS Monterey, created the web-based version of the questionnaire and supported electronic data collation. Alexia Treble, Research Assistant, CNS Washington, DC, provided extensive support in data collection, the web presentation of survey results, and in drafting the final survey report. CNS Washington interns Mark Hilpert, Colin Sterling, and Aubrie Ohlde also contributed significantly to collecting data for the project. Lawrence Scheinman, Distinguished Professor of International Relations, Monterey Institute of International Studies, served as senior advisor to the project. Dr. George Quester, Professor of Government and Politics, University of Maryland, and Dr. Brad Roberts, Member, Research Staff, Institute for Defense Analysis, and Adjunct Professor, George Washington University, served as advisors to the project. The team is also indebted to many colleagues at the Center for Non-

proliferation Studies for their suggestions, including, CNS Director William C. Potter, Deputy Director Amy Sands, and Coordinator of Education Programs, Fred Wehling. This article was prepared by Leonard S. Spector with Alexia Treble.

² Indeed, at the 74 non-military institutions surveyed, only a half dozen undergraduate courses focused specifically on nonproliferation. The list includes one at Georgetown, taught by Lawrence Scheinman and Allan Krass; one at Georgia Institute of Technology, taught by Adam Stulberg; one at Yale, taught by Theodore Hirsch (a non-recurring seminar); one at the University of Virginia, taught by John Redick, and two at Princeton—a course taught by Frank von Hippel, Zia Mian, and Ron Nelson and a non-recurring “Task Force” seminar, taught by Harold Feiveson.

³ See <<http://disarmament.un.org/education/stdy-ann2.html>> . For an overview and analysis of the report, see <<http://cns.mii.edu/pubs/week/021007.htm>> .

⁴ The list was based on rankings published by *U.S. News and World Report* for 2001 for the top 25 national universities; top 25 public universities; and top 25 liberal arts colleges, plus the four U.S. armed services academies. With certain duplications and other factors, discussed below, taken into account, the total number of schools surveyed came to 78. The magazine ranked the top 25 national universities (with state of location) as: 1. Princeton University (NJ), 2. Harvard University (MA), 3. Yale University (CT), 4. California Institute of Technology, 5. Massachusetts Institute of Technology, 6. Stanford University (CA), 7. University of Pennsylvania, 8. Duke University (NC), 9. Columbia

University (NY), 9. Dartmouth College (NH), 9. University of Chicago (IL), 12. Northwestern University (IL), 12. Rice University (TX), 14. Cornell University (NY), 14. Washington University (St. Louis, MO), 16. Brown University (RI), 16. Johns Hopkins University (MD), 18. Emory University (GA), 19. University of Notre Dame (IN), 20. University of California, Berkeley, 21. University of Virginia, 21. Vanderbilt University (TN) 23. Carnegie Mellon University (PA) 23. Georgetown University (DC), 25. University of Michigan, Ann Arbor.

The top 25 public universities (note that three schools also appear as top national universities) were ranked as: 1. University of California, Berkeley, 2. University of Virginia, 3. University of Michigan, Ann Arbor, 4. University of California, Los Angeles, 5. University of North Carolina, Chapel Hill, 6. College of William and Mary (VA), 7. University of California, San Diego, 8. University of Wisconsin, Madison, 9. University of Illinois, Urbana-Champaign, 10. Georgia Institute of Technology, 10. University of California, Davis, 10. University of California, Irvine, 13. University of Washington, 14. Pennsylvania State University, University Park, 15. Texas A&M University, 15. University of California, Santa Barbara, 15. University of Texas, Austin, 18. University of Georgia, 19. University of Florida, 19. University of Minnesota, Twin Cities, 21. Ohio State University, Columbus, 21. Purdue University, West Lafayette (IN), 21. University of Maryland, 24. Rutgers University (NJ), 24. University of Delaware, 24. University of Iowa, 24. Virginia Institute of Technology. Note that the list includes a total of 27 schools because of the tie for 24th place.

The top 25 liberal arts colleges in the *U.S. News and World Report* rankings were: 1. Amherst College (MA) 2. Swarthmore College (PA), 3. Williams College (MA), 4. Wellesley College (MA), 5. Bowdoin College (ME), 5. Carleton College (MN), 5. Haverford College (PA), 5. Pomona College (CA), 9. Middlebury College (VT), 10. Davidson College (NC), 11. Grinnell College (IA), 11. Wesleyan College (CT), 13. Washington and Lee College (VA), 14. Harvey Mudd College (CA), 14. Smith College (MA), 14. Vassar College (NY), 17. Bryn Mawr College (PA), 17. Claremont McKenna College (CA), 17. Colgate University (NY), 20. Colby College (ME), 20. Hamilton College (NY), 22. Bates College (ME), 22. Oberlin College (OH), 24. Mount Holyoke College (MA), 24. Trinity College (CT).

Together with the four service academies surveyed — the U.S. Military Academy, West Point (NY); the U.S. Naval Academy, Annapolis (MD); the U.S. Air Force Academy, Colorado Springs (CO); and the U.S. Coast Guard Academy, New London (CT)—and counting only once the three public universities that are found on two lists, the total number of schools in these cohorts comes to 78.

⁵ See note 4

⁶ See note 4

⁷ See note 4

⁸ See note 4

⁹ Some general courses, it may be noted, devote considerable time to WMD matters. Avery Goldstein's course on International Security at the University of Pennsylvania (one of the top 25 national universities), for example, devotes 40 percent of its sessions to WMD, including units on nuclear strategy during the Cold War, the middle nuclear powers, ballistic missile defense, and nonproliferation. As another example, Natalie Goldring's Seminar in International Relations: Issues in General Disarmament at the University of Maryland (a leading public university discussed below), devotes roughly half its time to WMD issues, including WMD technologies; nuclear diplomacy and doctrine of the 1940s, 1950s, and 1960s; nuclear testing; strategic arms control; and the role of UN disarmament initiatives. Benjamin Schiff's course on War, Weapons, and Arms Control at Oberlin (one of the leading liberal arts colleges) also devotes seven weeks over a semester to a number of WMD subjects that it integrates into a wider curriculum. WMD topics here include the U.S. decision to use nuclear weapons against Japan, U.S. efforts to curb the North Korean nuclear program, the Cuban missile crisis, and bilateral and multilateral arms control initiatives.

¹⁰ A copy of the questionnaire can be found at <<http://www.cns.miis.edu/pubs/npr/survey.htm>>.

¹¹ This group has 27 members because of tying scores in the *U.S. News and World Report* ranking. See note 4.

¹² See, for example, tutorials that are being sponsored by the Nuclear Threat Initiative on key nonproliferation treaties and on such issues as WMD terrorism <http://www.nti.org/h_learnmore/h3_tutorial.html>.

¹³ For the purposes of its rankings, *U.S. News and World Report* defines "National

University" as schools with student bodies drawn from across the United States (and abroad) that grant Ph.D. degrees, as well as offer undergraduate degree programs.

¹⁴ Some courses are offered annually, some semi-annually, and some every two years. Inasmuch as a course offered on any of these schedules would presumably be available to a student at least once during his or her tenure, the chart does not differentiate among courses according to this factor. In addition, the tabulation includes courses that may be given only once and that are included as standard components of departmental catalogues. It was assumed that such courses occur randomly among schools each year and that including them in tabulations was consistent with the attempt to obtain a "snapshot" of teaching in the field during a typical two-year period.

Note: courses specifically designed for Reserved Officer Training Corps (ROTC) students are not covered in the survey, which focuses on courses available to the entire student body of the schools in question.

¹⁵ Yale offered a particularly rich menu of general undergraduate courses touching on WMD, including James Sutterlin's The United Nations and the Maintenance of International Peace; American National Security Policy, taught by the former director of the National Security Agency, General William Odom (all political science); Mary Habeck's, The Military, War, And Society in the United States, 1865 to the Present (History); and John Gaddis's The Cold War (both History). Specialized courses include Daniel Kevles's Nuclear America (History/History of Science); Mark Sheetz's Nuclear Revolution (military/strategic impact of nuclear weapons); Paul Bracken's Strategy, Technology, and War (both in political science). In addition, during 2001, Yale offered a seminar by visiting lecturer Theodore Hirsch on The New Nuclear Arms Control (special attention to nonproliferation).

¹⁶ Course syllabi for many of the courses mentioned in this article can be found at <<http://www.cns.miis.edu/pubs/npr/survey.htm>>. Note: For simplicity, the *Review* has omitted the formal rank of the professors mentioned in this article, except in cases of visiting professors, whose status is noted as a reminder that the course(s) they are teaching may not be part of a school's permanent curriculum.

¹⁷ A handful of such courses were observed at other categories of educational institutions discussed below.

¹⁸ The University of California, Berkeley; the University of Michigan; and the University of Virginia, it should be noted, appear both on this list and on the list of the 25 leading national universities.

¹⁹ This is Susan Wright's course at the University of Michigan; as noted above, the University of Michigan appears on both the list of leading U.S. national universities and the list of leading public universities.

²⁰ Other participating schools are the University of Massachusetts at Amherst and Hampshire College. In the fall of 2001, Michael Klare of Hampshire College taught a course on international security at the University of Massachusetts that covered U.S.-Russia and U.S.-China security issues, including national missile defense, leakage of nuclear materials from the former Soviet Union, and Chinese sales of sensitive technology to states of proliferation concern.

²¹ Telephone interview, October 2002.

²² Telephone interview, October 2002.

²³ See note 2.

²⁴ For more on the Pew Case Histories, see <<http://sfswww.georgetown.edu/sfs/programs/isd/files/pub.htm>>. Faculty-authored case studies are available for a modest fee. Student-prepared case studies are available gratis at this site and include those on: India's Nuclear Tests: The Consequences for International Security; Chemical Arms Control: The U.S. and the Geneva Convention of 1925; The Second Berlin Crisis 1958-1959; On the Brink of War: India-Pakistan and the 1990 Kashmir Crisis; Restraint or Retaliation: Israeli Responses to the Iraqi Scud Attacks of 1991.

²⁵ E-mail, David Elliot to Leonard Spector, October 13,

²⁶ E-mail, Michael Klare to Leonard Spector, October 8, 2002.

²⁷ Telephone interview, November 2002.

²⁸ Telephone interview, November 2002.

²⁹ Telephone interview with John Mearsheimer, September 2002.

³⁰ E-mail provided from a University of California, Berkeley scholar.

³¹ Stephen Kotkin, "A World War Among Professors," *New York Times*, September 7, 2002, Section B, p. 9.