# State Scholars Core Courses

## English – 4 Years

English I, English II, English III, English IV

## Mathematics – 3 Years

Algebra I, Geometry, Algebra II

## Science – 3 Years

Biology, Chemistry, Physics

## Social Studies – 3 ½ Years

Chosen from U.S. History, World History, World Geography, Economics, Government

## Languages – 2 Years

2 years of a language other than English

## Wyoming P-16 Education Council

P.O. Box 1766
Laramie, WY 82073

# Features of Secondary School and Postsecondary Mathematics Courses[a]

| Feature | Typical secondary school mathematics course | Typical entry-level postsecondary mathematics course |
|---|---|---|
| 1. Total number of class sessions | 150 class sessions of 45-to-60 minutes each or 85 sessions of 90 minutes each are spread over 36 weeks (about 20 to 30 other class days are consumed by other activities). | 30 class sessions of 75 minutes or 45 class sessions of 50 minutes are spread over 15 weeks; course content is covered at three times the speed that is typical of a secondary school course. |
| 2. Textbook costs paid by student | $0. | $105-$170 for a new mathematics textbook; $75-$120 for a used textbook (if available); $40-$60 for an electronic textbook (if available)[b]. |
| 3. Instructional methods | A mix of lecture, whole-class discussions, and questioning; small-group work; in-class discussion of tests. | Mostly lecture in large classes (40 or more students); a mix of lecture, whole-class discussions, and questioning in smaller classes. |
| 4. Extra help in understanding course content | The teacher usually initiates individual help sessions based on the teacher's review of the student's classroom performance, homework, and test results; the teacher takes primary responsibility for identifying the source of the student's difficulties and designs corrective measures; the instructor or tutors hired by the school system lead tutorial sessions outside of class. | Graduate students conduct group help sessions (attendance is voluntary) to review problems assigned as homework; additional help is available from the staff of departmental tutoring centers or through individual sessions with the course instructor; students are responsible to schedule individual help sessions with an instructor; students must come to help sessions with written samples of their work and must be prepared to ask specific questions. |
| 5. Instructional emphasis | Emphasis is on developing "mathematical apprentices" prepared to use specific mathematical techniques such as those on the statewide Proficiency Assessments for Wyoming Students. | Emphasis is on developing "mathematical practitioners" who can select and apply a wide array of mathematical tools in solving problems. |
| 6. Uses of technology | Calculator- or computer-based investigations carried out during class sessions; some district-selected measures of academic performance administered on-line. | Calculator- or computer-based investigations carried out between class sessions; in-class use of "clickers" to record responses of all students to multiple-choice items; web-administered and scored homework assignments; proctored, web-administered exams (Gateway Exams) on key mathematical procedures taught in the course. |
| 7. Homework assignments and their evaluation | Two to five assignments are given per week, each requiring 20 to 40 minutes of work; assignment focus is on exercises[c] rather than problems[d]; assigned work is evaluated once or twice a week with feedback to individual students. | One to three assignments are given per week, each requiring 60 to 150 minutes of work; assignments include both exercises[c] and problems[d]; scores on web-administered homework assignments are sent automatically to the instructor for use in grading; there may be in-class comments on students' responses to selected homework problems. |

# Features of Secondary School and Postsecondary Mathematics Courses[a]

| Feature | Typical secondary school mathematics course | Typical entry-level postsecondary mathematics course |
|---|---|---|
| **8. Quizzes (one- or two-item assessments of key concepts)** | An average of one each week done in class to assess understanding of current material; responses usually checked immediately by fellow students or, where possible, by computer. | Possibly one or two per week (often as take-home work) to assess understanding of current material; more frequent quizzes in community college classes; in-class quiz responses usually checked through student-instructor discussion or, where possible, by computer. |
| **9. Session-long tests (i.e., "hour exams")** | 8 to 18 instructor-designed tests covering blocks of course material; cumulative midyear and final exams; tests are spread over the 36 weeks; retakes and make-up exams often allowed; test content focused on mathematical exercises[c]; additional tests that include mathematical problems selected by school districts as measures of academic performance and administered district-wide as many as five times a year. | Usually four tests in a university course, two tests plus a cumulative midterm and final exam; test content includes both exercises[c] and problems[d]; makeup tests or retakes permitted only under extraordinary circumstances; Gateway Exams (see Item 6 above) may be retaken; more frequent testing at community colleges. |
| **10. Basis of final grade assigned** | A combination of measures including **some** quizzes, all session-long tests, homework, participation in whole-class and small-group work, and oral and written reports of mathematical investigations; measures assigned different "weights" in determining the final grade. | Final grade mostly based on session-long tests with more "weight" being assigned to the midterm and final exams; some instructors may assign **minor** weight to class attendance and participation, to completed homework (collected at random), or to quizzes; failure to demonstrate understanding of a high percentage (about 85%) of the key concepts on a Gateway Exam lowers a student's course grade one letter. |
| **11. Instructor's outside-class responsibilities** | Sponsor student organizations and social events; communicate with parents by phone, mail, computer, or home visits; attend faculty meetings; serve on faculty committees; participate in the work of professional organizations; participate in school or district professional development. | Sponsor student organizations; conduct and publish research; guide research of graduate students; serve on faculty committees; work with professional organizations [Note: Many university classes are taught by graduate students—**full-time students** taking graduate courses and doing research.] |

[a] These are features of courses that are delivered face-to-face, not via the Internet.

[b] According to a national study, the typical four-year college student pays a total of $850 per year for textbooks and supplies. That's an average. For some college majors, the cost is much higher.

[c] A mathematical exercise is a well-defined task for which the solution path is immediately obvious. It calls for the use of one or more specific mathematical concepts or procedures in situations closely resembling those recently studied. The instructional function of exercises is to develop and exhibit efficient use of the specific concept(s) and procedure(s).

[d] A mathematical problem is a task for which no solution path is immediately obvious. It may have many solution paths, each of which requires the application of multiple mathematical concepts, procedures, and problem-solving strategies. The instructional function of problems is to develop and exhibit flexible application of mathematical knowledge to new situations.

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