

Leeward Community College

Accelerated Algebraic Foundations

1. Course Alpha

MATH

2. Course Number

82

3. Number of Credits

4.0

4. Effective Term

Fall 2011

5. Course Title

Accelerated Algebraic Foundations

6. Catalog Title

Accelerated Algebraic Foundations

7. Prerequisites

Any one of the following, or an articulated equivalent, within the past two years will qualify a student for MATH 82: CR in MATH 18 OR C or better in MATH 22 OR qualifying placement test score (30 or higher in the COMPASS algebra placement domain).

8. Corequisites

None

9. Recommended preparation

None

10. Catalog Description

MATH 82 covers essential algebraic concepts and procedures needed for success in College Algebra, Survey of Mathematics, and Statistics courses: signed numbers; exponents; roots, and radicals; expressions and polynomials; special products; factoring; linear equations, inequalities and systems; quadratic equations; rational expressions and equations; graphing; function notation; and applications.

11. What are the general student learning outcomes? (What knowledge and/or skills will successful completion develop in the students?)

Students who successfully complete MATH 82 should be able to:

- Identify and practice sound math study skills.
- Correctly apply procedures to solve equations, inequalities, and systems.
- Correctly apply procedures to simplify a variety of algebraic expressions.
- Correctly apply factorization techniques to polynomials.
- Analyze linear and quadratic equations to graph lines and parabolas.
- Select and correctly utilize precise mathematical language and symbols to effectively communicate procedures and results.

12. Course Content

What evidence exists that the course content is appropriate, relevant, and covered in sufficient depth? (addresses breadth, depth, relevancy) What evidence exists that the course reflects current theory and practice in the content area? (addresses currency)

The topics covered in MATH 82 are:

- Properties of, and operations with, real numbers, exponents, and polynomials including special products.
- Rational expressions (including complex fractions) and radicals.
- Solving linear, quadratic, and rational equations.
- Solving linear inequalities in one and two variables.
- Solving 2x2 systems of linear equations and inequalities.
- Properties and graphs of lines and simple parabolas.
- Introduction and use of function notation.
- Factoring: common factors, binomial special products, trinomials, and grouping.

Evidence that these topics are appropriate, relevant, and covered in sufficient depth include:

- These topics correspond to the topics currently collectively covered in Leeward CC's MATH 73 and 83 courses. Rather than spiral the level of difficulty over the two courses, MATH 82 covers the material in depth in a single semester and gives the students the same chances at success in transfer-level courses as the two semester MATH 73-83 sequence does.
- Since these topics duplicate coverage of existing MATH 73-83 topics, existing articulation agreements with the other UHCC campuses should be preserved.
- These topics and their depth of coverage correspond to the standard topics in contemporary elementary and elementary/intermediate algebra textbooks that are widely used nationally and thus vetted by peer institutions.

Evidence that the course reflects current theory and practice in the content area include:

- A wide selection of current textbooks and technology was reviewed and considered before the course content and anticipated course procedures were decided on by a committee of Leeward CC math faculty, who have been teaching a variety of courses over many years.
- The anticipated course procedures follow contemporary principles of course redesign as promulgated by national organizations.
- Student learning will be supported by current mathematical educational software that has been vetted by many peer colleges nationwide and whose contemporary successes have been widely documented.

- 13. How is this course related to the educational needs and goals of the division, college, and community as reflected in the Strategic Plan? How is it related to courses and programs in other disciplines?**

MATH 82 combines the topics covered in the current pair of courses MATH 73 and 83 into a single course. MATH 82 can reduce the time needed to reach a transfer-level course from two semesters to one. In addition, when MATH 82 and MATH 18, the companion course, are offered in the redesigned format, sufficiently motivated students will have the opportunity to finish the entire developmental sequence of math courses in a single semester. In these ways, MATH 82 addresses strategic outcome B.2.b of the 2008-2015 Strategic Plan Update: Modify the traditional structure and delivery of programs to accommodate the full-time adult student and that shortens student time to degree.

MATH 82 will provide students with a single-semester alternative to the two-semester pair of courses MATH 73 and 83 in the sequence of developmental mathematics courses.

The following courses list MATH 73 or MATH 83 as a prerequisite or recommended preparation. Since MATH 82 contains the combined content of MATH 73 and MATH 83, MATH 82 could be considered as an alternative.

- FAMR 230
- ICS 100
- ICS 110
- ICS 113
- ICS 125
- SCI 122

No Leeward CC program lists MATH 73 or MATH 83 as a required course.

- 14. For what program was the course designed? Is it an approved program? Will the course be required or elective? Will the course lengthen the time for the students to complete the program? Will it replace another course?**

MATH 82 is not designed for any degree or certificate program.

MATH 82 is an elective course for all students.

MATH 82 will not lengthen the time for students to complete a program.

MATH 82 can replace MATH 73 and MATH 83 in the sequence of developmental math courses. MATH 73 and MATH 83 are also elective courses that were not designed for any degree or certificate program.

- 15. How many hours will the students spend per week in lectures, laboratories, seminars, or other supervised instruction?**

MATH 82 could be offered either as a lecture or as a redesigned, lab-style course. The distinction will be noted in the comments section of the schedule of courses listing.

As a lecture course, students will spend 4 hours per week in class for 16 weeks, which is the usual for a 4 credit course.

As a redesigned, lab-style course, students will be expected to spend at least 4 hours per week in supervised computer-aided study. One weekly hour will be scheduled. Other hours can be completed in the Math Lab any time during their hours of operation.

- 16. What independent work will be required of students? (Reading, research, writing, special projects, etc.) For written or other special projects, identify the usual number and length of projects. For readings, where the entire book or pamphlet is not used, indicate the portion of the material to be used.**

MATH 82 could be offered either as a lecture or as a redesigned, lab-style course. The distinction will be noted in the comments section of the schedule of courses listing.

As a lecture course, students will be expected to prepare textbook or computerized homework and prepare and submit other assignments, which could include quizzes and written reports.

As a redesigned, lab-style course, students will be expected to work independently in computer-aided study in order to meet weekly progress goals.

- 17. What experiential or professional preparation is required to teach this course? Do we have a full-time faculty member who meets these requirements? If not, who will teach the course?**

All full-time mathematics discipline faculty members are able to teach MATH 82.

By UHCC system-wide agreement of the academic Deans, the current minimum qualification required for a full-time instructor in developmental mathematics is any one of the following:

- Master's degree in mathematics
- Master's degree in education with a bachelor's degree in mathematics
- Master's degree in math education

- 18. Is a similar course taught at any other community college? Any other UH college? If so, provide information about the course identification and content of similar courses. If this course differs in important ways from existing similar courses, explain how.**

UH Maui College offers MATH 82 (Accelerated Algebraic Foundations, 4 credits) that contains the same content as MATH 82 at Leeward CC. UH Maui College's MATH 82 is offered only in redesigned, lab-style format.

In addition, MATH 82 contains more than 80% of the content of the following pairs of developmental courses offered at other UH community colleges:

- MATH 24-25: Elementary Algebra I-II at Honolulu CC
- MATH 24-25: Elementary Algebra I-II at Kapiolani CC
- MATH 24-25: Elementary Algebra I-II at Hawaii CC
- MATH 24-25: Elementary Algebra I-II at Kauai CC
- MATH 24-25: Elementary Algebra I-II at Windward CC

- 19. If this course is comparable to a course taught on a four-year campus, and is intended to count in lieu of that course, the proposal must contain evidence of up-to-date information as to the content and objectives of the course on the four-year campus. (This information may be obtained through discussion with faculty teaching the course on the four-year campus or by obtaining a**

copy of the course syllabus or outline.)

NO

Not applicable

20. If the course is appropriate for articulation with the UH Manoa general education core or with any other department or college requirements on a UH four-year campus, provide a brief rationale.

Not applicable

21. Methods of instruction

- Class Discussion
- Computer Activities
- Demonstrations
- Group discussions
- Internet enhancement
- Lab
- Lectures
- Problem-based learning
- Tutors

Instructors normally use a combination of the methods mentioned above in an attempt to maximize effectiveness of instruction. Faculty members teaching the course engage in continuing dialogue amongst themselves as well as with their colleagues from other campuses to discuss teaching techniques and strategies. They also attempt to maintain currency through participation in conferences supported by organizations such as the Pacific Islands Mathematical Association of Two-Year Colleges and the Hawaii Council of Teachers of Mathematics.

22. Methods of Evaluation

- Attendance
- Exam
- Others
- Take home assignments

Method of Evaluation
Attendance
Exam
Others
Take home assignments

- Others include computer-generated and corrected homework and assessments. Instructors normally use a combination of the methods mentioned above in an attempt to accurately assess a student's mastery of the course material.

23. Is Textbook Required

When offered as a lecture course, a textbook will be required.

When offered as a redesigned, lab-style course, an access code for the appropriate educational software program will be required, and a textbook will be optional.

24. Exclude from Catalog

NO

25. Justify the level of proposed course:

What evidence exists that the course appropriately covers areas with sufficient emphasis for a remedial, a developmental, or a college-level course? (addresses rigor)

MATH 82 covers the combined topics in MATH 73 and 83 (formerly numbered 24 and 25 respectively), which have been offered at Leeward CC for many years. MATH 73 and 83 are articulated with the other UHCC campuses, showing that the content and depth are appropriate within the system. MATH 82 will cover topics in contemporary, standard developmental algebra textbooks, which adds further evidence to the appropriateness and emphasis of the course content.

26. Will this course require additional staff, equipment, facilities, or other cost items? If so, are they available? Are they included in the budget, or will they be covered by reallocation?

No, since sections of MATH 82 will replace some sections that would previously have been assigned to MATH 73 and MATH 83.

27. Expectations for Student Participation. Students are expected to spend at least two hours outside of class for every hour in class by means of the following activities:

- Computer Projects
- Homework Assignments
- Practice Lab Time

28. What change is proposed in the course? (Provide specific information on both the new and the old course.)

The prerequisite is being adjusted slightly (allowing a C, rather than the more restrictive B, in MATH 22) in preparation for full implementation of developmental math course redesign at the Pearl City campus in fall 2011.

29. What is the rationale for the change?

The prerequisite is being adjusted slightly (allowing a C, rather than the more restrictive B, in MATH 22) in preparation for full implementation of developmental math course redesign at the Pearl City campus in fall 2011. Starting in fall 2011, MATH 73 will not be offered at the Pearl City campus, so without this change, Pearl City students earning a C in MATH 22 would be required to take MATH 18, which covers material similar to that contained in MATH 22. Students earning a C in MATH 22 will have a sufficient background to attempt MATH 82, though they may have to spend more independent study time performing review. The Waianae campus expects to continue offering MATH 73 in the near future.

30. Is the change substantive enough to require a change in course identification? If so, explain in

detail.

No.

31. Is the course currently articulated with any four-year program? If so, give details and dates of agreement(s) and explain any impact the proposed change may have upon articulation.

No.

32. Will the change require additional staff, equipment, facilities or other resources? If so, provide details and indicate whether they are available.

No.

33. Will this change increase or decrease the number of required hours for attainment of a certificate or a degree? If so, provide details and justification.

No.

34. Distance Education

- a) what methods will be employed to ensure timely and effective interaction between faculty and students and student to student?
- b) What technological skills will students need to succeed in this course?
- c) How will the instructor execute and ensure the rigor and breadth of the course through electronic delivery?

Though not strictly a distance course, there are many aspects of the redesigned model that are similar to a distance course.

During the orientation conducted on the first scheduled class meeting, students will acclimate themselves to the required software, learn about course requirements, and familiarize themselves with the technology procedures. Additional technological assistance will be available from the instructor during subsequent scheduled class meetings as well as from tutors during open lab time. For students who do substantial computerized study off-campus, phone, email, Lulima, and messaging systems built into the required software program will be extensively utilized to ensure timely and effective communication between students and faculty and, where appropriate, among students.

No specialized skills beyond email and Internet access and familiarity are needed in order to succeed in MATH 82. The required software program has tutorials that guide students through entering answers, graphing, and other specialized technological operations.

Rigor and breadth are executed and ensured by the careful selection of the software package, careful selection of the topics covered and requiring proctored testing.

35. Distance Education

What type of academic support and technology training will be required to ensure pedagogical development of the instructor for this course?

Faculty training and practice in the selected program were ongoing throughout the development for the original developers of the course. Training sessions were and are scheduled for support staff, tutors, and new faculty who are expected to teach the course.

30. Distance Education

How will specific technology be integrated into the course, and how will its use be appropriate to the nature and objectives of the course?

The sections of the course that follow the redesign model rely primarily on a publisher-developed and supported platform for learning, assessment, and reporting. The appropriateness and success of the programs that were considered by the original developers of the course have been documented at the national level.

37. Course Curricular Function: (Please explain the function of this course as it relates to the College Mission and the achievement of relevant degree and certificate program requirements.)

MATH 82 relates to the "Learning and Teaching" statements in the Leeward CC Mission (2010-2011): To specialize in the effective teaching of remedial/developmental education, general education, and other introductory liberal arts, pre-professional, and selected baccalaureate courses and programs, with the goal of seamless system articulation and transfer, where appropriate. To structure our programs in such a way that they reflect not only academic rigor but also student development, learning outcomes and student goals. The College is committed to the achievement of student learning.

Though not designed for a specific degree or certificate, MATH 82 serves as an alternative to MATH 73 and MATH 83 in the sequence of developmental mathematics courses.

38. What evidence exists that the course is taught so that skills are built on what has been learned earlier in the course (or in a previous course) and will lead to what will be learned in a future course?

The mathematics discipline has carefully planned the content of this course to meet the needs of transfer-level mathematics courses while keeping in mind the specific prerequisite skills learned in MATH 18 (or MATH 22). This choice and alignment of topics was the result of a discipline-wide review of all of the developmental mathematics course syllabi, consultations with transfer-level mathematics faculty, and inspection of syllabi and course materials from MATH 103 at other campuses.

39. Comments

The division vote was 24 for; 0 against; 0 abstained.

40. Justify the need/demand for the proposed course. (Attach documentation, e.g., surveys, reports, advisory committee recommendations, etc.)

In 2004, system-wide representatives met to analyze data gathered by the UHCC systems office regarding placement test cut scores. Many of the systems office recommendations were vetted and eventually approved by the system Deans. However, the systems office recommendations regarding developmental algebra were rejected by the faculty. The data indicated that the minimum cut scores for MATH 24 and 25 (now numbered 73 and 83) should be raised. However, doing so with no other curricular changes would mean that many students would place into a lower course and thus have their programs lengthened by a semester as a result. The disagreement led to discussions, some renumbering, and an alignment of topics among the courses still numbered 24 and 25 but the placement test cut score issue remained unsettled due to the issue of lengthening students' time to program completion.

MATH 82 allows Leeward CC to adopt the data-supported UHCC systems office recommended cut scores without compromising the mathematics sequence or lengthening a student's program. The

scores without compromising the mathematics sequence or lengthening a student's program. The systems office recommended cut score for MATH 24 (30 in COMPASS algebra) will be used for MATH 82 and the recommended cut score for MATH 25 (40 in COMPASS algebra) will be used for MATH 83.

- 41. If the course is renumbered to be 100 or above, how does it meet the criteria for Transfer Courses, Attachment III? An analysis as to how those criteria are met should be provided.**

Not applicable

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