Leeward Community College

Degree: Associate in Science
Division: Mathematics and Natural Sciences
Title: Natural Sciences
Description: A 2 year degree to prepare students for further study in the sciences. It is equivalent to that offered by Kapiolani Community College.
Effective Date: Fall 2011

1. Are the program outcomes appropriate functions of the college and University? (Relationship to University and campus mission and development plans, evidence of continuing need for the program, projections of career opportunities for graduates, etc.)

Leeward CC currently prepares students for transfer to a four-year baccalaureate program in the sciences. This program provides pathways, support, and recognition for those students' efforts, and it ensures that students will enter a baccalaureate science program with the skills and knowledge required to promote success.

This program does not require students to take the additional classes required for a Leeward Community College AA degree that are not required for a UH Manoa baccalaureate degree.

This program addresses the majority of the Mission Statements of Leeward Community College.

The program provides "Access" (Mission Statement #1) by providing pathways towards baccalaureate science degrees for Leeward Community College Students.

The program provides "Learning and Teaching" (Mission Statement #2) with "seamless system articulation and transfer" by providing pathways towards baccalaureate science degrees for Leeward Community College Students.

The program provides "Work Force Development" (Mission Statement #3) by providing pathways towards baccalaureate science degrees for Leeward Community College Students.

The program provides "Personal Development" (Mission Statement #4) by providing pathways towards baccalaureate science degrees for Leeward Community College Students.

This program provides "Community Development" (Mission Statement #5) by graduating STEM majors who will provide leadership, knowledge, and problem-solving skills.

MISSION

Access: To broaden access to post-secondary education in Hawai‘i, regionally, and internationally by providing open-door opportunities for students to enter quality educational programs within their own communities.

Learning and Teaching: 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.

Work Force Development: To provide the trained workforce needed in the State, the Asia-Pacific region, and internationally by offering occupational, technical, and professional courses and programs which prepare students for immediate and future employment and career advancement.
Personal Development: To provide opportunities for personal enrichment, occupational upgrading, and career mobility through credit and non-credit courses and activities.

Community Development: To contribute to and stimulate the cultural and intellectual life of the community by providing a forum for the discussion of ideas; by providing leadership, knowledge, problem-solving skills, and general informational services; and by providing opportunities for community members to develop their creativity and an appreciation for the creative endeavors of others.

Diversity: To build upon Hawaii's unique multicultural environment and geographic location, through efforts in curriculum development, and productive relationships with international counterparts, students’ learning experiences will prepare them for the global workplace, with particular emphasis on Asia and the Pacific Rim.

2. What are the outcomes of the program? (outcomes should be stated in terms of meeting student, community or State needs. Also includes Program Learning Outcomes.)

The overall objective of the A.S. Natural Sciences degree is to allow students to complete a degree while completing the first two years of study towards a baccalaureate degree in STEM fields of study. This was not possible in two years with the additional course requirements of the Leeward CC AA degree.

Upon graduation, students will be able to:

1. analyze effectively
2. communicate scientific ideas and principles clearly and effectively
3. evaluate the aims and methods of science
4. analyze and apply fundamental mathematical, physical, and chemical concepts and techniques to scientific issues
5. analyze and apply fundamental concepts and techniques in their chosen field of study, such as biology, chemistry, geology, engineering, etc.
6. use computer technology to analyze and present experimental results

The first three PLOs correlate with the five statements regarding General Education Core and Graduation requirements for the Associate in Arts degree.

3. How is the program organized to meet its outcomes? (Description of curriculum organization, requirements, admission policies, advising and counseling, and other aspects of the program, with reference to its outcomes.)

The Associate of Science Degree (A.S - Natural Sciences) is awarded to students who complete the following:

1) 60 credits, all in courses numbered 100 or above. 4) Two writing intensive courses in any discipline.

2) The last 12 Concentration and/or Natural Science Elective 5) One Hawaiian, Asian, Pacific (HAP) course.

credits must be earned at Leeward Community College. 6) Cumulative grade point average of 2.0 or higher for all

3) A maximum of 48 transfer credits earned at other colleges courses numbered 100 or above completed at Leeward CC.

may be applied towards the degree. 7) General education and program requirements, as
indicated below.

Foundation Requirements (13 credits)
I. Foundation Written Communication (FW) (3 credits required)
   ENG 100 or ESL 100/ENG 100E
II. Foundation Symbolic Reasoning (FS) (4 credits required)
   MATH 205
III. Foundation Global Multicultural Perspectives (FG) (6 credits required from 2 groups)
   GROUP A: ANTH 151, ART 175, HIST 151
   GROUP B: ANTH 152, ART 176, HIST 152
   GROUP C: GEOG 151, MUS 107, REL 150

Diversification Requirements (10 - 13 credits)
IV. Diversification Social Sciences (DS) (3 credits required)
   AMST 211, 212 POLS 110, 120, 130, 180
   ANTH 150, 200, 210, PSY 100, 180, 202, 240, 260
   ECON 120*, 130*, 131* (*Engineering students must choose one of these.)
   GEOG 102 SOC 100, 214, 218, 231, 250, 251
   IS 221 WS 151, 290

V. Diversification Arts, Humanities, and Literature (DA/DH/DL) (3 credits required)

Diversification Arts (DA)
   (Mainly Theory) ART 101 DRAM 101 MUS 108, 253, 281, 282, 283, 284
   (Mainly Practice) ART 104, 104D, 105B, 105C, 106, 107, 107D, 112, 113, 113D, 114, 115,
       123, 202, 213, 243, 244
   DNCE 121, 131, 132, 160, 180 DRAM 221, 222, 240, 260
   MUS 103, 104, 112, 113, 114, 121, 122, 180, 201, 221, 222, 232
SP 251* (*Available for Engineering students only.)

Diversification Humanities (DH)

AMST 201, 202 HIST 231, 232, 241, 242, 260, 281, 282, 284
ART 171, 172, 180 IS 250H PHIL 100, 101, 102, 200, 201, 211, 212, 213
ASAN 203, 204 LING 102 REL 151, 200, 201, 202, 203, 204, 205, 207, 210
GEOG 122 MUS 106, 265, 266
HWST 107

Diversification Literature (DL)

EALL 271, 272 HUM 261, 262
ENG 250, 251, 252, 253, 254, 255, 256, 257H, 257N

VI. Diversification Natural Sciences (DB/DP/DY) (4 - 7 credits required)

Diversification Biological (DB) (3 credits required* **) *Not required for Engineering but BIOL 101, 171, MICR 130 or ZOOL 101 suggested for CEE.

ANTH 215 **Life Science must take BIOL 171.
BIOL 100, 101, 124, 130, 171, 172, 200, 201
BOT 101, 130 SCI 107
FSHN 185 ZOOL 101, 200, 240, 241
MICR 130

Diversification Physical (DP) (3 credits required)

CHEM 161 (CHEM 161B = 3 cr. 161 + 1 cr. 161L)

Diversification Laboratory (DY) (1 credit required)

CHEM 161L

VII. Additional Requirements (6 - 7 credits required)

Computer Competency (CC) (3 credits required)

ICS 101
EE 150* (*Engineering students only and they must choose this course.)

General Chemistry (GC) (3 - 4 credits required*)

CHEM 162 (CHEM 162B = 3 cr. 162 + 1 cr. 162L)

CHEM 162L* (*Not required for Engineering.)

VIII. Concentration Requirements (5 - 26 credits required)

Select one of the Natural Science Concentrations

Life Sciences Physical Sciences Engineering

BIOL 171L 1 cr. MATH 206 4 cr. MATH 206 4 cr.

BIOL 172 3 cr. PHYS 170 4 cr. PHYS 170 4 cr.

BIOL 172L 1 cr. PHYS 170L 1 cr. PHYS 170L 1 cr.

PHYS 272 3 cr. PHYS 272 3 cr.

PHYS 272L 1 cr. PHYS 272L 1 cr.

MATH 231 3 cr.

MATH 232 3 cr.

EE 211 4 cr.

CE 270 3 cr.

IX. Natural Science Electives (14 - 22 credits required)

Select classes required for your program which are not chosen above.

BIOC 241 BOT 101 GG 101 MATH 206 PHRM 203

BIOC 251 BOT 101L GG 101L MATH 206L

BOT 130 GG 103 MATH 231 PHYS 151 (Life Sci. only)

BIOL 171 MATH 232 PHYS 151L (Life Sci. only)
BIOL 171L CHEM 272B  HORT 110  PHYS 152  (Life Sci. only)

BIOL 172 CHEM 273B  ME 213 PHYS 152L  (Life Sci. only)

BIOL 172L  ICS 111 PHYS 170

BIOL 265 CE 270 ICS 141 MICR 130 PHYS 170L

BIOL 265L CE 271 ICS 211 MICR 140 PHYS 272

BIOL 275  ICS 212  PHYS 272L

BIOL 275L EE 150  ICS 241 OCN 201 PHYS 274

EE 211  OCN 201L

EE 213 ZOOL 200

EE 260 ZOOL 240

ZOOL 241

Writing Intensive Courses (2 courses) 1. ____________________________ 2. ____________________________

Focus: Hawaiian, Asian, and Pacific (HAP, 1 Course) 1. ____________________________

Important note: Appropriate course substitutions may be made with the prior written approval of both the appropriate Division Chair and Dean.

4. Who will enroll in the program? (Special target groups, if any; number of majors expected by year for first five years; expected service to non-majors; evidence of student interest.)

The program will recruit students from two general sources - incoming freshmen seeking a science degree and students enrolled in science courses to fulfill diversification requirements.

1. Incoming freshmen seeking a science degree will be recruited via counseling and Leeward CC's catalog containing degree descriptions. Students seeking a science degree will have formal, well-structured pathways.

2. Students will be recruited from the College's introductory science courses that non-science majors take to fulfill Gen Ed diversification requirements. Non-science majors commonly are inspired by introductory science courses to major in a science. The College's introductory course instructors will be able to counsel students using the pathways that correspond with the students' specific interest and goals.
5. **What resources are required for program implementation and first five-year cycle operation?** (Number, source, and cost of faculty; library requirements; support personnel; estimated cost of supplies, equipment and CIP; facilities to be utilized; total funds required for program implementation and operation; expected source of funds, including sources of reallocated funds.)

No additional cost. All the courses that fulfill degree requirements currently are offered by the College. The personnel, supplies, and equipment costs are part of the current College and MS Divisions' budgets.

6. **How efficient will the program be?** (Compare anticipated cost per SSH, cost per major, SSH/faculty, average class size or other quantitative measures with other programs in the college and similar programs on other UH campuses.)

The proposed program will utilize classes already taught at Leeward CC. The efficiency of offering those classes will be determined by the standard methods already in place. Efficiency should be high since most of the required classes currently are fully or over enrolled. Since no new faculty are appointed to help with the program and no monies are allocated for supporting the program, the anticipated cost, cost per SSH, and cost per degree should be zero.

Comparisons with the AS-NS program offered at Kapiolani CC are as follows: KCC reports a budget of $741,973 per year after an initial $1.25 million Tribal Colleges and Universities Program (TCUP) grant to start the program, and they awarded 43 degrees the first year and 113 the second.

The Teacher training program (AAT) at Leeward CC is a comparable program on this campus. They report a budget of about $235,000 per year with an additional $199,544 in General Funded Budget Allocation and $38,642 in Special/Federal Budget Allocation, and they awarded 246 degrees the first year and 358 the second.

At Leeward CC 3 credits of release time was allocated by the college and 3 credits of release time was also provided by the Halau to generate the program.

After the program is approved it is expected that the information concerning cost per SSH, SSH/faculty, average class size and other quantitative measures will be available.

7. **How will effectiveness of the program be demonstrated?** (Projected number of graduates yearly; placement of graduates; special accreditation; student satisfaction; career and employer satisfaction, etc.)

Effectiveness will be evaluated by the number of graduates as well as the number of students following the pathways without obtaining a degree.

It is expected that 25 students will obtain degrees each year with a 10% increase during each of the first 5 years.

Graduates should continue their studies and obtain a four-year baccalaureate degree in STEM fields.

### Attachments

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<th>Version</th>
<th>File Name</th>
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**Campus:** LEE  
**Updated By:** MLANE  
**Updated Date:** 09/29/2011