

Viticulture and Enology

College of Agricultural Sciences
and Technology

Department of Viticulture and Enology

Robert L. Wample, *Chair*

Helen Chrisman, *Administrative Support
Coordinator*

Viticulture and Enology Research Center
2360 E. Barstow Ave, M/S VR89
(559)278.2089

FAX: (559)278.4795

<http://cast.csufresno.edu/ve/>

B.S. in Enology

B.S. in Viticulture

M.S. in Viticulture and Enology

Certificate of Special Study in Enology

Certificate of Special Study in Sustainable Viticulture

The Department

It is the goal of the Department of Viticulture and Enology to be a world class center of excellence that can effectively meet the needs of students and the broader community. The department offers courses in viticulture and enology. Each degree integrates viticulture and/or enology offerings with the basic sciences (e.g., biology, chemistry, mathematics, physics) and management skills to build a well-balanced foundation.

Academic Excellence

Universities in California are recognized both nationally and internationally as the educational leaders in enology and viticulture. California State University, Fresno is one of only two universities in the country to offer a full program of study in enology. California State University, Fresno was also the first to establish a commercial winery in the United States. The viticulture program at Fresno State has received a National Award for Excellence in Agricultural Technology Instruction from R.J. Reynolds Industries Inc.

The formation of the new department has been greeted with enthusiasm by the viticulture/wine industry. It is anticipated that graduates will be able to choose from many exciting, well-paying careers. To discuss career



opportunities available in this field, call the department office and schedule an appointment to meet with a faculty adviser.

Mandatory Advising

It is the policy of the department that every student see his/her assigned adviser at least once during the academic year.

Faculty

In their fields of specialization, faculty members hold advanced degrees from leading universities. They bring a wealth of basic and practical information into the classroom. Faculty work with each student to plan and design an individualized program of study that meets the student's educational and career objectives. Faculty members are involved in research and public service through the Viticulture and Enology Research Center, one of four centers in the California Agricultural Technology Institute. The center offers excellent opportunities for students to gain experience by participating in applied research projects that address and help solve problems faced by California's grape and wine industries.

Robert L. Wample, *Julio R. Gallo Chair*

Sayed A. Badr

Kenneth C. Fugelsang

Sanliang Gu

Roy J. Thornton

Bachelor of Science Degree Requirements

Viticulture Major

Units

Major requirements36

VIT 101, 102, 103, 105, 106, 160,
165, 196 (2 units), 199 (1 unit);
ENOL 15, 45; PL TH 103, 105,
106

Additional requirements 49

BOT 10, 130; CHEM 3A, 8,
150; AGEC 1; PLANT 99, 105,
150; SW 2, 100, 100L, 101;
MEAG 3

Select 6 units in consultation with
faculty adviser from the follow-
ing courses:

AGEC 31, 110N, 117, 120, 130;
ENOL 135, 163, 175; HORT
114

General Education requirements.....51

12 of these G.E. units are included
in the *additional requirements*.

These courses are 3 units of
CHEM 3A [B1]; BOT 10 [B2];
AGEC 1 [D3]; and PLANT 105
[IB]. Therefore, 39 remaining
General Education units are
required.

Upper-division

writing skills requirement0

Upper-division Writing Exam
(See Advising Note 6.)

Total units 124*

* This total assumes that students will maximize
the 12 units required for the major that also
may be applied to fulfill General Education
requirements as indicated above.

Bachelor of Science Degree Requirements

Enology Major

Units

Major requirements43

ENOL 15, 45, 105, 114, 116,
125, 135 (2 units), 151, 163,
164 (6 units), 166 (2 units),
175, 199 (1 unit); VIT 101,
102, 106

Additional requirements 44

BOT 10, 130; CHEM 1A, 1B, 8, 105, 150; DS 71; AGECE 1; MICRO 140; PLANT 105; SW 100, 100L

General Education requirements.....51

15 of these G.E. units are included in the *additional requirements*. These courses are 3 units of CHEM 1A [B1]; BOT 10 [B2]; DS 71 [B4]; AGECE 1 [D3]; and PLANT 105 [IB]. Therefore, 36 remaining General Education units are required.

Upper-division

writing skills requirement1

Upper-division Writing Exam
(See Advising Note 6.)

Total units..... 124*

* This total assumes that students will maximize the 15 units required for the major that also may be applied to fulfill General Education requirements as indicated above.

Advising Notes

1. During the Add/Drop period of their first semester, students are required to attend a department undergraduate orientation session. Alternatively, they are required to meet with the department chair. In either case, they will be assisted in selecting an appropriate faculty adviser.
2. Students meet with their academic advisers prior to registration each semester.
3. General Education courses designated as required by the department are prerequisites to many courses in the program of study. The General Education requirement of 51 units may be exceeded depending upon your selection of courses.
4. **CR/NC** grading is not permitted for courses included in the major.
5. Upper-division G.E. courses (i.e., 100-level course) should not be attempted prior to the semester in which 60 units toward the degree have been completed.
6. If the upper-division writing skills requirement is not met by passing the university Upper-Division Writing Examination (0 units), then a 3- to 4-unit **W** course (e.g., PLANT 110W or ENGL 160W) must be passed with a grade of **C** or higher.
7. One semester prior to graduation, contact your academic adviser to prepare and file an official certification of major requirements form. Your application for graduation cannot be processed by the Evaluations Office until this form has been submitted.

8. Students are encouraged to become certified crop scientists/specialists and should consult their faculty adviser for additional requirements for certification.

Certificate of Special Study

The Department of Viticulture and Enology offers a Certificate of Special Study in Enology. Normally, students admitted to this certificate program will have completed an undergraduate degree in a related field. This program is specifically designed for those who wish to pursue a career in wine-making. The certificate program emphasizes coursework in enology and viticulture, with requirements in other supporting sciences. Before enrolling in this certificate program, students must meet with an adviser in the Department of Viticulture and Enology to ensure that prerequisites have been met and to plan for their course of study.

The program consists of a minimum of 31 units in enology. If students have completed courses that qualify as part of the 31 units in enology, substitutions shall be made in consultation with an adviser to meet the 31-unit requirement. The Certificate of Special Study in Enology has additional requirements totaling up to 50 units that may be satisfied by previously completed coursework. Each student will meet with the certificate adviser to determine whether these requirements have been met by proper coursework or extensive experience in the field.

Required Qualifications:

1. Normally, a bachelor's degree from an accredited institution in the sciences or a related field

Preferred Qualifications:

1. One or more years of experience in the wine industry
2. Strong background in chemistry, microbiology, or food science
3. Academic training and experience in viticulture and soils

Students who have completed all of the prerequisites and additional requirements could possibly complete this course of study in a single year. Other students may take longer. The time limit for completing this certificate program is five years.

Certificate Program **Units**

Required courses.....31
ENOL 105, 114, 116, 125, 135,

151, 163, 164, 166, 175, 199;
VIT 106

Additional courses or their equivalents.....46

BOT 10; CHEM 1A, 1B, 8, 105, 150; ENOL 15, 45; MICRO 140; PLANT 105; SW 100, 100L; VIT 101, 102

Certificate of Special Study in Sustainable Viticulture

The Certificate of Special Study in Sustainable Viticulture is specially designed for those students interested in pursuing a career in sustainable viticultural practices. Students who are admitted to the certificate program must have completed a minimum of a bachelor's degree from an accredited university or the equivalent international degree.

The program consists of 30 units which may be taken from upper-division (100-199) and/or professional courses (300-399). Courses approved for the Certificate of Special Study in Sustainable Viticulture are listed below.

Advising Notes

1. Courses taken at California State University, Fresno (or another accredited university) used to fulfill the requirements of a degree program cannot be used to meet the requirements for the certificate program.
2. Courses taken at other universities will be reviewed by the faculty in the Department of Viticulture and Enology to determine equivalence.
3. Students are required to work with an adviser to develop a plan for courses to be used to meet the certificate requirements. Course plans must be approved prior to enrollment in courses used to meet certificate requirements.
4. Students who have not taken the approved courses in viticulture and/or enology (see *Approved Courses*) to meet the requirements for a previous degree/certificate must take those courses as electives in the Certificate of Special Study in Sustainable Viticulture program.
5. Students who have taken the approved courses in viticulture and/or enology (see *Approved Courses*) to meet the requirements for a previous degree/certificate may select electives from other approved courses in consultation with an adviser.

Viticulture and Enology

6. Several of the courses approved for the certificate program have prerequisites not included on the approved course list. Students are required to complete all prerequisites prior to enrolling in courses used for the certificate program.

Program Requirements. Each student must complete a minimum of 30 units with an average grade of 2.0 or higher and with a minimum grade of *C* in each course used to meet certificate requirements.

Required Categories

1. Social responsibility as applied to agriculture (such as PLANT 105) - 3 units
2. Qualitative and quantitative evaluation (such as MATH 107*) - 3 units
3. Public policy and regulations (such as AGECE 150* or 155*) - 3 units

Approved Electives 21 units (minimum)

Selected from the list of *Approved Courses* (see below) in consultation with an adviser.

Total units 30 units (minimum)

Approved Courses

Viticulture: VIT 101*, 102*, 103*, 105*, 106*, 165*, 162T (see adviser for approved topics), 199

Enology: ENOL 105*, 135*

Agricultural Economics: AGECE 110*, 117*, 120*

Biological Sciences: BIOSC 130*; ECOL 151*, 172*

Plant Science: MEAG 130; PLTH 107*, 108*; SW 100 and 100L, 101*, 104*, 111*, 111AG*

*Course has prerequisites; see *General Catalog*.

Master of Science Degree Program

The Master of Science in Viticulture and Enology is a 30-unit program designed to provide advanced studies and in-depth knowledge in the fundamentals of plant physiology, microbiology, and grape and wine chemistry, as well as technical writing and formal presentation of research reports.

Full-time graduate students may earn the degree within two years when working closely with an adviser. To accommodate part-time students, graduate courses are offered in the late afternoon or evenings.

Admission Requirements. The Master of Science in Viticulture and Enology assumes

preparation equivalent to a Bachelor of Science in Viticulture and/or Enology, Agricultural Chemistry, Food Science and Nutrition, Plant Science, or a related area from an accredited institution. The following courses or equivalents are expected to be completed prior to enrollment in courses to be applied to the master's program: BOT 10, 130; CHEM 8, 150; ENOL 116, 125, 166; PLTH 103, 105, 106; SW 2, 100; VIT 101, 102.

Admission Materials. To be considered for admission to the graduate program, the candidate must submit the following materials: evidence of a baccalaureate degree in agricultural chemistry, enology, food science, nutrition, plant science, viticulture, or a related area from an accredited institution; official transcripts of all college work; official scores from the Graduate Record Exam (GRE); a university application; three letters of reference from employers or faculty at the university most recently attended; and a statement of 500 words or less indicating reasons for pursuing a master's degree.

Admission Application Filing Periods

Check www.csufresno.edu/catoffice/current/admsns.html or call the Graduate Admissions Office at 559.278.2261.

Enrollment Packet Submission Deadlines.

Check <http://cast.csufresno.edu/ve>
Incomplete packets of materials will be returned to students for resubmission the following semester. Required application materials are available in the Department of Viticulture and Enology, VR 89, 559.278.2089, fax 559.278.4795. The department Web site is <http://cast.csufresno.edu/ve>.

Admission Criteria: Candidates for admissions will be evaluated using criteria including undergraduate coursework, grade point average of 3.0 or better (last 60 semester units), GRE scores (480V/580Q are equivalent to the 50th percentile), 500-word or less statement of professional goals, and letters of reference. Students lacking in any area with compensating strengths in other areas are encouraged to apply. Admission by the university does not imply acceptance in the Master of Science in Viticulture and Enology program. Applicants whose preparatory education was in a language other than English must earn a minimum TOEFL score of 550 and a minimum score of 4 on the Test of Written English (TWE).

Classified standing will be granted to students who meet all of the admission criteria.

Conditional classified standing may be granted to applicants with 2.75 to 2.99 GPA (last 60 semester units) and/or those required to complete prerequisite coursework. Prerequisite coursework is not included in the 30-unit master's program. Students must request classified standing in the program by the semester in which a maximum of 10 units to be used toward the degree are completed.

Program Requirements for Viticulture and Enology

All students must complete a 14-unit common core. Students must also complete 12 units of approved electives and a 4-unit thesis (culminating experience) in consultation with a thesis adviser.

Units

Core 14
AGRI 200, 220; VEN 210, 229, 280

Approved Electives 12
BOT 137; CHEM 225; FN 221T; IT 223, 282; PLANT 252, 254, 256, 257, 258; VEN 214*, 225*, 250T, 251*, 264*, 275*, 290

Culminating Experience 4
VEN 299

Total minimum requirements 30
*Development of VEN electives in progress.

Graduate Advising Notes

1. Several of the approved elective courses have prerequisites other than courses listed as admission requirements.
2. To obtain the required school application form and more specific information concerning the Master of Science in Viticulture and Enology, interested students should call or write the department office. Upon acceptance into the Master of Science in Viticulture and Enology program, students should obtain the *Graduate Student Handbook* from the department office.
3. Upon acceptance into the Master of Science in Viticulture and Enology program, students will be assigned an initial faculty adviser by the department chair. Students may subsequently select a faculty adviser upon obtaining his/her approval and notifying the department office of that selection.
4. Elective courses are selected in consultation with the student's faculty adviser.
5. To progress through the graduate program, students must
 - a. maintain a minimum of 3.0 GPA,
 - b. complete all prerequisite coursework,
 - c. attain classified standing,
 - d. meet university graduate writing requirement,

- e. pass the department qualifying examination,
 - f. file for advancement to candidacy,
 - g. complete the program requirements,
 - h. file a master's thesis committee assignment form, and
 - i. satisfactorily present and defend the thesis research results.
6. All students must successfully complete the department qualifying examination before being advanced to candidacy. The exam should be taken as soon as possible after completing AGRI 200, 220, and PLANT 257. Information on the department preliminary examination is included in the *Graduate Student Handbook*.
 7. Advancement to candidacy requires the completion of 9 program units in residence, meeting the university graduate writing requirement, passing the Viticulture and Enology Department qualifying exam, and filing a Petition for Advancement to Candidacy a minimum of one semester prior to enrollment in thesis and within the deadline.
 8. The Graduate Writing Requirement may be met by passing the writing component of AGRI 220. Please see the program coordinator for more information.

See *Division of Graduate Studies* in this catalog for university requirements.

COURSES

Enology (ENOL)

ENOL 15. Introduction to Enology (3)
History and development of the wine industry; mechanics of various processes and factors affecting wine quality and consumer acceptance.

ENOL 45. Wine Evaluation Techniques (2)

Parameters that determine sensory quality in wines. Wine appreciation. Critical evaluation of wines including premium varietals. Must be 21 years of age — state law. (1 lecture, 2 lab hours) (Formerly ENOL 25)

ENOL 105. Advanced Sensory Evaluation of Wines (3)

Prerequisites: ENOL 45 and ENOL 164 (ENOL 164 may be taken concurrently). Factors affecting the quality of wines in terms of growing region, grape maturity, harvesting, vinification, cellaring, blending, and storage practices; attributes and defects in premium varietals. Statistical concepts. (2 lecture, 2 lab hours)

ENOL 114. Analytical Methods for Wine I (2)

Corequisite: ENOL 164; prerequisite: CHEM 105 (may be taken concurrently) or permission of instructor. Fundamental prin-

ciples and practices of methods of analysis for grape juice and wine during crush. Emphasis on practical laboratory procedures. (1 lecture, 3 lab hours) (Formerly ENOL 162T)

ENOL 116. Analytical Methods for Wine II (2)

Corequisite: ENOL 166; prerequisites: ENOL 114, 164, CHEM 105, or permission of instructor. Fundamental principles and practices of methods of analysis for wine and wine products during cellaring operations. Emphasis on practical laboratory procedures. (1 lecture, 3 lab hours) (Formerly ENOL 162T)

ENOL 125. Wine Microbiology (4)

Prerequisites: ENOL 15; MICRO 140; CHEM 150. Identification, physiology, and biochemistry of bacteria and yeasts involved in winemaking and spoilage of wines. Vinous and malolactic fermentations. Sherry organisms and other film yeasts. (2 lecture, 6 lab hours)

ENOL 135. Field Studies (2; max total 6)

Prerequisite: ENOL 15 or permission of instructor. A six-day field trip during the spring recess visiting wineries to study the techniques and handling methods employed by the many vintners. Students must provide own transportation, meals, housing, and insurance.

ENOL 140. Regulations: Wine and Brandy (2; max total 2)

Prerequisite: ENOL 15 or permission of instructor. Rules and regulations concerning wine and brandy licensing, record keeping, production, taxation, enological practices, rule making, and labeling. Interstate and international commerce. Export requirements. (Formerly ENOL 162T)

ENOL 145. Brandy Production (3)

Prerequisites: ENOL 164; CHEM 101 or 109 or IT 112 recommended. Distillation principles and practices for the production of brandy and other distilled beverages. Raw materials, aging, and sensory evaluation. Students may be required to purchase supplementary materials for class use. (2 lecture, 3 lab hours)

ENOL 151. Winery Equipment (2)

Prerequisites: ENOL 15; 135 (may be taken concurrently). Evaluation, use, location, operation, and repair of winery equipment. Winery safety. Safety equipment required. (1 lecture, 3 lab hours)

ENOL 162T. Topics in Enology and Fermentation Science

(1-4; max total 12 if no topic repeated)
Prerequisite: ENOL 15. Topics in wine-making and fermentation science. Some topics may include labs.

ENOL 163. Fermentation Laboratory (2)

Prerequisite: ENOL 15 (may be taken concurrently). Vinification/Fermentation Laboratory practice at the university's Enology Pilot Plants. Individual winemaking. Students must supply their own grapes. Cannot be taken concurrently with ENOL 164. (6 lab hours)

ENOL 164. Wine Analysis and Production (6; max total 12)

Corequisite: ENOL 114; prerequisites: CHEM 1A; CHEM 1B or 105; CHEM 8; ENOL 151. Only open to enology and viticulture students. Laboratory and winery experience in winemaking operations, including harvest, scheduling, crushing, fermentation, safety, sanitation procedures, record keeping, analysis, and operation of enology facility equipment. Safety equipment required. (2 lecture, four 3-hour labs)

ENOL 166. Cellar Operations (2; max total 4)

Corequisite: ENOL 116; prerequisites: ENOL 114, 164 (must be taken the previous semester). Survey of cellaring operations and equipment. Analytical methods, blending, fining, ion exchange, finishing, and bottling. May be repeated once for credit. (1 lecture, 3 lab hours; local field trips)

ENOL 168. Juice and Concentrate Production (2)

Prerequisites: ENOL 15; CHEM 1A or 3A. Principles and practice of modern fruit juice and concentrate production. (1 lecture, 3 lab hours; field trips)

ENOL 173. Wine Marketing (2)

Prerequisites: ENOL 45; AGEC 1. Marketing principles as applied to wine. Role of wholesalers, distributors, retailers, cooperatives. Advertising. Regulations. Interstate and international trade.

ENOL 175. Winery Management (3)

Prerequisites: ENOL 15 and permission of instructor. Physical properties of a winery; administrative organizational setup; personnel; purchasing, packaging and shipping; local, state, and federal regulatory statutes.

ENOL 180. Undergraduate Research (1-4; max total 4)

Prerequisite: ENOL 164. Open to juniors or seniors with permission of instructor. Exploratory work on a suitable agricultural problem in enology. Approved for *RP* grading.

ENOL 190. Independent Study (1-3; max total 6)

See *Academic Placement — Independent Study*. Approved for *RP* grading.

Viticulture and Enology

ENOL 196. Enterprise Management (1-6; max total 6)

Prerequisites: ENOL 166, 175; FSC 178; VIT 101, 102. Application of management principles in wine production. Operation of the California State University, Fresno commercial winery. Open only to enology or viticulture students. Safety equipment required. Approved for *RP* grading and *CR/NC* grading.

ENOL 199. Undergraduate Seminar (1; max total 2)

Oral presentations of topics of current interest in enology, wine grapes, and fermentation science.

Viticulture (VIT)

VIT 1. World Viticulture (3)

Origin and distribution of European (Old World) grapevines and their "New World" relatives. The use of grape and grape products in various regions of the world. Not open to viticulture or enology majors.

VIT 101. Principles of Viticulture (4)

Prerequisite: BOT 10 or BIOL 10. Current status and future of the grape industry. Characteristics and identification of leading raisin, table, wine and rootstock varieties. Growth and physiology of the grapevine. Climatic and soil requirements for grape growing. Principles and practices of grapevine nutrition. (3 lecture, 3 lab hours)

VIT 102. Advanced Viticulture (3)

Prerequisite: VIT 101. Planning of new vineyards. Vine propagation, planting, training, and trellis systems. Recent developments in viticultural practices, with emphasis on raisin, table, and wine grape production. (2 lecture, 3 lab hours)

VIT 103. Raisin Production and Processing (3)

Prerequisite: BOT 10 or BIOL 10 or VIT 102. Principles and practices of raisin production; sun drying, mechanical dehydration, on-the-vine drying; new raisin processes to produce new products. (2 lecture, 3 lab hours)

VIT 105. Production and Marketing of Table Grapes (2)

Prerequisite: VIT 102. An overview of the table grape industry in California. Major table grape growing regions in the world, U.S., and California. Varietal adaptation to climate and soils. Cultural practices and vineyard management. Post-harvest technology and marketing strategies. Field trips. (1 lecture, 3 lab hours)

VIT 106. Winegrape Production (2)

Prerequisite: VIT 102. Advanced viticulture course in the science of winegrape production. Covers the basics and advanced technology of winegrape growing for wine production. (1 lecture, 3 lab hours)

VIT 160. Mechanized Viticulture (3)

Prerequisite: MEAG 3 or equivalent (may be taken concurrently). Provides detailed description of the machinery used to establish vineyards, carry out cultural practices, and harvest grapes for production of wine grapes, raisins, and table grapes. Objective is to provide student with an understanding of machinery designed for grape production and the principles of machinery operation. (2 lecture, 3 lab hours) (Formerly VIT 162T)

VIT 162T. Topics in Viticulture (1-4; max total 4)

Prerequisite: junior standing. Oral presentations by invited speakers on topics of current interest to viticulture.

VIT 165. Grapes Varieties and Rootstocks (2)

Prerequisite: VIT 101. Taxonomy and ampelography of the grapevine with emphasis on genus, species, varieties, and clones. Identification, viticultural attributes, adaptation, and utilization of the leading rootstocks, raisin, table, and wine varieties grown in California and the United States. (1 lecture, 3 lab hours)

VIT 180. Undergraduate Research (1-4; max total 4)

Prerequisites: VIT 101 and 102 or permission of instructor. Open to juniors or seniors with permission of instructor. Exploratory work on a suitable agricultural problem in viticulture. Approved for *RP* grading.

VIT 190. Independent Study (1-3; max total 6)

See *Academic Placement—Independent Study*. Approved for *RP* grading.

VIT 196. Viticulture Projects (1-4; max total 4)

Prerequisite: MEAG 3 or MEAG 5 and VIT 101 or equivalent. Knowledge gained from classroom instruction applied to vineyard conditions. Students will be assigned to a block in the university vineyard and participate in cultural practices and marketing the crop. This course must be taken twice to complete the project; a minimum of 2 units are required. Approved for *RP* grading and *CR/NC* grading.

VIT 199. Undergraduate Seminar (1; max total 4)

Seminar format in which professionals in the grape and wine industry will make 30-

to 40-minute presentations. Afterwards, there will be five to 10 minutes reserved for questions. The seminars are intended to elicit considerable interaction among participants. The setting is informal. (Formerly VIT 162T)

Viticulture and Enology (VEN)

VEN 210. Grape and Wine Chemistry (4)

Prerequisite: CHEM 150. Mechanistic basis for the chemistry and biochemistry of vines, grapes, yeast, and bacteria used in winemaking, wine spoilage, and health issues of alcohol and wine. Critical evaluation of the literature pertaining to the above subjects.

VEN 229. The Graduate Seminar (1; max total 2)

Prerequisite: permission of instructor. Oral presentations on topics of current interest in viticulture and enology. Develops skills in critical review and analysis of current literature and recent advances.

VEN 250T. Topics in Viticulture and Enology (1-3; max total 6 if no topic repeated)

Prerequisites: admission to a graduate program in the College of Agricultural Sciences and Technology and permission of the instructor. Advanced studies of current topics in viticulture and enology selected by instructor. Students will be required to prepare oral and written presentations demonstrating an in-depth understanding of the chosen topic(s). Participation in classroom discussion will be required as part of the grade.

VEN 280. Research in Viticulture and Enology (2)

Prerequisites: AGRI 200 and 220. History, current trends, and modern methodology for research in viticulture and enology. Exposure to funding opportunities and dissemination of research results in the grape and wine industry. Involves critical evaluation of published literature on grape and wine research.

VEN 290. Independent Study (1-3; max total 3)

See *Academic Placement — Independent Study*. Approved for *RP* grading.

VEN 299. Thesis (4)

See *Criteria for Thesis and Project*. Prerequisite: advancement to candidacy. Preparation, completion, and submission of an acceptable thesis for the master's degree. Oral defense of thesis required. Approved for *RP* grading.