BATANGAS STATE UNIVERSITY
Bachelor of Science in Food Engineering

Program Catalogue
BACHELOR OF SCIENCE IN FOOD ENGINEERING

PROGRAM CATALOGUE

CHEMICAL AND FOOD ENGINEERING DEPARTMENT
COLLEGE OF ENGINEERING, ARCHITECTURE AND FINE ARTS
BATANGAS STATE UNIVERSITY
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BATANGAS STATE UNIVERSITY

Vision

A globally-recognized institution of higher learning that develops competent and morally upright leaders who are active participants in nation building and responsive to the challenges of 21st century.

Mission

Batangas State University is committed to the holistic development of future leaders by providing a conducive learning environment for the generation, dissemination and utilization of knowledge through innovative education, multidisciplinary research collaborations, and community partnerships that would nurture the spirit of nationhood and help fuel national economy for sustainable development.

Core Values

• Faith

The University’s initiatives and activities are guided by a strong faith in a Supreme Being. These are anchored on high regard and respect for the beliefs and orientation of each member of the academic community for a productive and meaningful co-existence.

• Patriotism

This value extends from promoting love of country to taking pride in being a Filipino. The University advocates a strong sense of commitment to national ideals through its active promotion of the Philippine culture and heritage, as well as concern for the environment and the nation’s natural biodiversity, all of which lead to the creation of a pool of professionals that are instrumental for nation building.

• Human Dignity

This value affirms the uniqueness, inherent worth, and distinction of every member of the community, with high respect to equality, social justice, and human rights. This is seen
as the most effective way to prevent or resolve conflicts, and is thus necessary to ensure civilized professional and personal relationship and a healthy University environment.

- **Integrity**

This pertains to the University’s steadfast adherence to morally-sound principles and ideals in the pursuit of institutional goals and objectives. It covers the values of accountability, honesty, righteousness, incorruptibility, and decency in the governance and implementation of academic, administrative, financial policies.

- **Mutual Respect**

This refers to the recognition and acceptance of individual and professional differences in the exercise of academic freedom and the freedom of expression. It is exhibited by a community that is progressive-minded and receptive to growth and positive change.

- **Excellence**

A strong commitment to excellence in the areas of instruction, research and extension services, as well as in the management of financial resources and in the general administration of the University, is the most significant factor in ensuring the successful attainment of the University’s vision. Excellence results to continuous quality improvement in the services offered by the University to its clientele.

### Research and Extension Service Thrusts and Priorities

The University shall pursue thrusts and priorities which may be subjected to review at least annually by each area: Architecture, Engineering and Technology; Agriculture and Natural Science; Environment and Biodiversity; Entrepreneurial and Business; and Education, Mathematics and Social Sciences to make the Research Program of the University responsive to the emerging needs and environmental changes and development depending on research competencies available, appropriateness to the local needs and availability of the resources. The following thrusts and priorities are based on the national, regional and provincial agenda of the government identified through agenda setting and road mapping among research personnel, deans, faculty researchers, students and external stakeholders.

1. Food;
2. Energy;
3. Environment;
4. Health and Medical Sciences; 

5. Material Science and Engineering; 

6. Information and Communications Technology; 

7. Manufacturing and Process Engineering; 

8. Science and Mathematics; and 


The University shall pursue extension service programs, activities and projects (PAPs) that will enable institutions, industries and communities, particularly the depressed and underserved, to achieve sustainable development through: 

1. Community Extension Services 

A. Capability-Building Training Program 

• Agricultural / Environmental Training for Farmers/Brgy. Officials 

• Livelihood / Technical-Vocational/Skills Training 

• Continuing Education for Professionals 

• Basic Education/Information Technology Literacy Training 

B. Community Outreach Program 

• Food and Nutrition/Health and Sanitation/Maternal and child-care 

• Medical/Dental/Optical Mission 

• Blood Donation 

• Clean and Green Community / Coastal Cleanup 

• Tree Planting 

• Nursery & Vegetable Garden Establishment 

• Relief Goods Operation 

• Gift Giving Activity 

• Youth and Sports Development/Environmental Camps 

• Visit to orphanages/prison camps/rehabilitation centers 

• Provide counseling/legal advice
• Fund Raising for Community Development

C. High-impact, long-term Integrated Community-based Development Program

• Adopt-a-Barangay Program
• Adopt-a-School Program
• Barangay Integrated Development Approach in Nutrition Improvement (BIDANI)
• Agro-industrial Community-based Technology Center

2. Institutional and Industry Development Program

A. Technical Assistance and Advisory Services

• Workers Education Services/Manpower Development Services
• Information and Communication Technology
• Engineering Design Consultancy
• Construction Supervision
• Disaster Mitigation
• Solid Waste Management
• Rural Development/Urban Planning
• Business / Financial Plan

B. Communication/Information Services

• Communication and/or Dissemination of knowledge and skills thru school-on-air program (DWPB FM 107.3)
• IEC Materials Development
• Information Drives

C. Technology Transfer, Utilization and Commercialization Program

3. Gender and Development (GAD) Program

A. Gender-responsive Planning and Budgeting
B. Gender Sensitivity Training
C. Gender Analysis
The University will continue to be responsive to the needs of the different sectors of the industry and community with which it interact. It shall consolidate the roles of the Office of the Extension Services and develop a strategic plan that provides a framework for institutional and industry linkage and community engagement with particular emphasis on meaningful poverty alleviation programs and provision of expert services needed by the communities in the service areas.
COLLEGE OF ENGINEERING
ARCHITECTURE AND FINE ARTS (CEAFA)

About the College

College of Engineering, Architecture and Fine Arts (CEAFA) is the premier college of the University. It is situated at Gov. Pablo Borbon Main Campus II, at Alangilan, Batangas City and is composed of nine (9) departments which include the Architecture, Interior Design and Fine Arts (ArIDFA), General Engineering (GE), Chemical Engineering and Food Engineering (ChE/FE), Civil and Environmental and Sanitary Engineering (CE/EnSE), Electronics and Communications Engineering, Instrumentation and Control Engineering, and Mechatronics Engineering (ECE/ICE/MexE), Electrical Engineering (EE), Industrial Engineering (IE), Computer Engineering (CompE), and Mechanical Engineering and Petroleum Engineering (ME/PetE). CEAFA caters to more than 4,000 students. The College offers a strong technical curriculum and a broad range of other educational opportunities for students to excel in their chosen career making them globally competitive and morally upright professionals.

The College is well known and respected for its competent and highly committed faculty members, sustaining its performance in delivering quality engineering education to the youth of Batangas and other service areas. With this, the College has gained national recognition in terms of instruction, research and extension services.

The College strives for excellence in instruction, research and extension. It seeks to establish a learning culture in which teaching and research of the highest quality are able to flourish equally. It is well-known for its remarkable high performance in the licensure examination and has always ranked as one of the top performing schools in the licensure examination since 1999 in different fields of engineering and architecture. The College is home to 122 Topnotchers in various licensure examinations given by the Professional Regulation Commission (PRC) notably in Architecture, Civil, Chemical, Electronics and Communication, Electrical, Environment and Sanitary, and Mechanical Engineering.
College Goals and Objectives

The College of Engineering, Architecture and Fine Arts (CEAFA) aims to develop a well-rounded graduate imbued with moral and ethical values, spiritual vigor, and utmost concern for the environment as integral parts of furtherance of a chosen profession.

It promotes excellence in the education of men and women who can assume leadership and meaningful participation in one’s chosen field of engineering, architecture, and fine arts.

Commitment

The College of Engineering is committed to:

1. Provide curricular programs for the development of a well-trained engineering professional very well conscious of environmental protection.

2. Advance the ideals of a national identity devoid of cultural biases, but enriched with moral integrity, spiritual vigor, and credible pursuit for professional excellence.

3. Develop professional graduates ready for entry as active participants and/or competent leaders in the industrialized world who are:
   a. Well-educated in the principles of a particular engineering discipline chosen,
   b. Well-trained in the art and science of industrial applications such as design and production to sales, management and operations.

4. Promote and environment
   a. For research and development so that students may advance the boundaries of knowledge in every professional facet of engineering.
   b. For entrepreneurship whereby products and services of a particular engineering field can be generated for business use and application.

Specific Objectives

The College of Engineering shall:

1. Inculcate in the students the tenet of moral values and attitudes required of a well-rounded personality fully equipped with critical thinking and sound moral judgment.
2. Produce competent graduates who could
   a. Supply professional expertise in the application of specific engineering processes
      suited to the needs of the nation in general, the community and the region in
      particular.
   b. Provide engineering solutions to the engineering problems related to the new ideas or
      existing ones like product development, service enhancement and environmental
      conservation and protection.

3. Trainable students as leaders who would be specialists in the various fields of engineering
   applications, and

4. Teach and encourage students to apply every engineering principles to the notion of
   entrepreneurship that would promote the development of products, services and viable
   technology to tap the existing and unrealized potentials of the community’s, country’s,
   and region’s resources.
ACADEMIC GUIDELINES

Testing and Admission

The Testing and Admission Office (TAO) of Batangas State University provides testing services to students, teachers and non-academic personnel who need assistance. TAO interprets these examinations to screen and weed out unqualified students and applicants to give way in the admittance of the deserving and qualified.

Entrance examination is given in the College levels between January and March of each year. Applicants are informed of the scheduled time and date of examination upon their application in the Testing and Admission Office (TAPO). The tests includes admission, classification, qualifying and psychological test in every program the University offers for the qualification to first year of the general engineering administered by the BatState-U examination coordinator. The results will be mailed two weeks after the examination.

Foreign students desiring to enroll in the University are required to meet substantially the entrance requirement prescribed for a course, provided that their prior training has been obtained in an institution of recognized standing and there is a place for them in the College.

The TAO testing (admission, classification, qualifying and psychological tests) functions are:

1. Administration, scoring and interpretation of all graduate tests including psychological tests for the selection of academic and non-academic personnel.

2. Updating and expansion of psychological test collections.

3. Validation of tests for local use.

4. Administers Engineering Classification Tests (ECT) for educational placement students, student practicum in the area of psychological testing and guidance.

The TAO admission functions are:

1. Gives information and policies, application procedures and course offerings of the university.

2. Implements admission testing programs for the graduate and undergraduate courses secondary, pre-elementary and elementary education of the university.
Requirements for BSU Entrance Examination

Entrance examination for General Engineering includes specification items namely: Mathematics (25 items), Formulation (10 items), Physical Science Comprehension (45 items), Arithmetic Reasoning (10 items), Verbal Comprehension (43 items) and Mechanical Comprehension (22 items). English Proficiency Examination is also conducted to evaluate their level of communication using the English language. If they failed the English Proficiency Examination, the student will be required to attend English 100 for preparation.

Undergraduate Course

Freshman Applicants

1. Filled-up applicants form for BSU Admission test.

2. Certified true copy of final grades in Math, Science, English and Filipino subjects from 1st to 3rd year high school or Certified True Copy of Form 138 (Report Card) if graduated from high school.

3. Two (2) recent copies of 2” x 2” ID pictures with applicant’s signature at the back.

4. Non-refundable testing fee of P250.00.

Transferes

1. Filled-up applicants form for BSU Admission test.

2. Transcript of Records/ Certification of Grades signed by the University/ College Registrar.

3. Certification of Good Moral Character.

4. Two (2) recent copies of 2” x 2” ID pictures with applicant’s signature at the back.

5. Non-refundable testing fee of P250.00.

Extension Trade Training Program (ETTP) 300 hours

1. Filled-up application form for BSU Admission Test

2. Certified true copy of Form 138 (Report Card) if applicant is a high school graduate or certified true copy of transcript of records of applicant had entered college.

3. Two (2) recent copies of 2” x 2” ID picture with applicant’s signature at the back.

4. Non-refundable testing fee of P250.00

5. Barangay Clearance for out-school youth applicants.
Requirements for Admission to BSU

**Undergraduate**

*Freshman Applicants*

1. Notice of Passing the BSU Admission Test

2. Admission Slip to be secured at the TAO upon payment of reservation fee at the Cashier’s Office.

3. Form 138 (Report Card, Original Copy)

4. Certification of Good Moral Character from high school where graduated.

5. Certified photocopy of NSO Birth Certificate


*Transferes*

1. Notice of Passing the BSU Admission Test

2. Admission Slip to be secured at the TAO upon payment of reservation fee at the Cashier’s Office.

3. Honorable Dismissal

4. Transcript of Records / Certification of Grades signed by the University Registrar.

5. Certification of Good Moral Character

6. Authenticated copy of NSO Birth Certificate

7. Chest X-ray result.

*Extension Trade Training Program (ETTP)*

1. Notice of Passing the BSU Admission Test

2. Admission Slip to be secured at the TAO upon payment of reservation fee at the Cashier’s Office.

3. Form 138 (report card, original copy)

4. Certification of Good Moral Character from high school where graduated

5. Certified copy of NSO Birth Certificate

**General Information for Freshman Applicants**

What to do?

1. Upon announcement secure an application form at the BSU Testing and Admission Office (TAO).

2. Fill-up application form for BSU Admission Test.

3. If qualified pay your examination fee of P250.00 at the Cashier’s Office.

4. Complete all the requirements (indicated at the back of the application form) needed for admission test.

5. Submit completed application form with two (2) recent copies 2” x 2” identical pictures with signatures at the back at the TAO not later than 3 days before the scheduled date.

6. When you personally submit your application form, get the test permit.

7. On the date and time specified in your test permit, take the BSU Admission Test. Bring the following:

   - [ ] Pencils
   - [ ] Erasers
   - [ ] Test Permit

8. On the date announced by your examiner, see the list of qualified applicants at the TAO Bulletin Board or inquire at 300-2202 local 121.

9. When you see your name in the list of qualifiers, bring the test permit in claiming your Notice of Passing (NOP).

10. After securing the Notice of Passing from TAO, pay the Reservation fee of P1,000.00 at the Cashier’s Office.

11. After paying the reservation fee, secure your admission slip from TAO.

12. On the date of schedule enroll at the college/school where you are admitted.

**Student Admission for BS Food Engineering Program**

The Chemical and Food Engineering department usually accepts students from the General Engineering who qualified as first priority in the Engineering Classification Test (ECT) for the Food Engineering program. The department chairman determines the number of students who will be accepted to the program depending on the demand for Food engineers and the grades of the students who will be accepted for the program.
The incoming Food Engineering students must complete majority of all required courses from the General Engineering curriculum and must pass the Engineering Classification Test wherein the students choose their program to be completed. All applicants to the program are interviewed and evaluated individually by the department chairman and/or the assigned faculty for student selection. The criteria in admission to the program are: General Weighted Average Equivalent (60%), Numerical Ability/Verbal Reasoning (30%), and Interview (10%). The students are ranked and are classified for sectioning. For the students who did not qualify to the BS Food Engineering program, a transmittal form will be signed by the Department Head for release and be accepted to the Engineering program chosen by student to take. The signature of the Department Head of the chosen Engineering program by the student should be affixed to confirm the acceptance of the student.

Once admitted, the students are required to bring a folder, accomplish the personal profile summary, and photocopy of their grades from the General Engineering. This is collected from the student serving as student information profile of the Department. Every enrollment, this will be updated by the student, academic adviser and the enrollment-in-charge.

For student returnees, those who have been out of the University for at least one semester and who wish to re-enter the University, must first secure an admission slip from TAO upon the recommendation of the College Dean, Associate Dean or Director for Academic Affairs.

**Revised BSU Selective Retention and Readmission Policies**

A student’s continued stay in the University is governed by these rules:

1. Any student who is in the 1st and 2nd year college and fails in 6 units of academic subjects shall be placed on a probationary status.

2. Any student who is in the 1st and 2nd year college and fails in 9 units of academic subject shall not be readmitted. However, he or she can be allowed to shift to another program or course provided he qualifies in the admission requirements.

3. Any student who had accumulated eighteen (18) units of failure in academic subjects at the end of any semester or term of any school year is ineligible to enroll for the next semester or term.

4. If at the end of any semester or term, the number of accumulated units of failure is not yet known because the grades have not yet been completed; the student may be allowed to enroll during the following semester or term.

5. If during that semester or term, the number of accumulated units of failure has been known to reach or exceed eighteen (18) units, the student will be allowed to continue his studies for the said semester or term but will not be allowed to enroll for the following semester or term.

6. Any student in his higher year of studies (4th – 5th year for five year courses and 3rd – 4th year for 4 year courses) who fails in 9 units academic subjects may be allowed to enroll upon submission of an approved request from the University President.
7. Any student who has accumulated 18 units failure in his higher year of studies (4th – 5th year courses and 3rd – 4th year courses) will be allowed to re-enroll in the following semester or term upon submission of an approved program of studies from University President thru Channels.

8. Any student who deliberately refuses to obey all rules and regulations prescribed by the University shall be disqualified for readmission.

9. If a student fails in a subject but re-enroll it and receives a grade of 2.75 or higher during the latter semester or term, the original failure will not be counted in the accumulation of the number of subjects and units failed.

10. Any student who enrolled or dropped out (INACTIVE) in the previous semester or term must apply in writing for readmission to the Chairman, Admission Committee. The criteria for readmission shall be the scholastic records of the department. The decision of the Admission Committee Chairman will be released before the close of the registration period.

11. Any student who drops subjects indiscriminately and or who cancels his enrollment for two (2) consecutive times may not be readmitted without a thorough review of the student's performance from the time he was first enrolled in the University.

12. Any student who has exceeded his length of stay (6 years for 5 year courses and 5 years for 4 year courses) as per program requirement due to academic delinquencies is ineligible to pursue his studies in the University.

13. Students who have been rendered ineligible to study at the University because of the above rules will not be allowed to re-enroll in the future. Responsibility for evaluation of eligibility still lies with student. Effectively of ineligibility is not dependent upon prior notice by the University Dean or Academic Adviser.

**Academic Calendar and Classes**

The Registrar shall prepare the details of the academic calendar of the University, subject to the approval of the VPAA and confirmation by the University President. The academic calendar shall prescribe the number of class days in the regular semesters and summer session, as well as the preliminary, midterm, semi-final and final examinations.

Each College shall prepare its own academic calendar which shall include the schedule of review classes and co-curricular activities, such as field trips, convocations, seminar-workshops, retreats, exhibits, academic contests and others.

It shall reflect in a separate calendar the non-academic events and extra-curricular activities such as sports tournaments, beauty and popularity contest, dances, fund-raising activities where included or not in the preceding paragraph, and other similar activities. The foregoing calendar shall be subject to the approval of the VPAA.
Note: Collegiate School Days shall consist of not less than eighteen (18) weeks per semester and six (6) weeks for summer classes, including Christmas, Semestral and Summer Breaks. The said school days shall include examination days and class days which may be suspended due to natural or man-made cause (CHED Memo Order (CMO) No. 33 Series of 2005).

**Enrolment**

Students shall complete their enrolment within the prescribed schedule. Enrolment beyond the schedules period will be fined per working day. In the case of incoming freshmen, enrolment dates are specified in their admission slip issued by the TAO.

Late registration is allowed only within one (1) week after the official opening of classes during the regular semester and not more than (3) days during the summer term.

Only students who have paid the corresponding fees assessed by the proper officials and whose registration forms have been approved by the University Registrar are considered enrolled and entitled to admission to classes upon presentation of class cards, approved registration form and Official Receipt (OR) of payment.

**Enrolment Procedure for Freshman Applicants**

1. Secure admission slip and approval of scholarship grant (if any) from the Testing and Admission Office (TAO) and Scholarship Office.

2. Submit chest x-ray result to the Clinic.

3. Present credentials to the College or School Dean.

At the Center for Student Services:

4. Secure printing of registration forms upon presentation of admission slip;

5. Request for the assessment of fees;

6. Pay PTA, SSC, Insurance fees;

7. Pay tuition and other fees (cash or installment basis) at the Cashier’s Office;

8. Submit credentials (admission slip, high school report card, certification of good moral character, NSO photocopy of birth certificate, 1 ID picture) to and secure final approval of registration and class cards from the Registrar’s Office; and

9. Proceed to ID Room for Identification Card.
Enrolment Procedure for Old Students

1. Present report of grades with proposal slip and have your grades of last semester attended evaluated for evaluation of subjects or courses to be enrolled by the Evaluator or Adviser.

(Applicable for Higher Engineering Year Level - Third to Fifth Year):
For irregular students, a program of study should be made. This will be done through the help of the respective academic advisers assigned to the student. Seek the approval of the Department Head and the Dean for the program of study that will serve as guide on the subjects to be enrolled by the student and the Evaluator assigned for the enrollment. In the proposal slip part, write all the subjects or courses to be taken and have this approved by the Evaluator or Department Head and the Dean.

2. Proceed to the Scholarship Office to secure approved scholarship (if any).

In the Center for Student Services:

3. Request for the printing of registration forms upon presentation of approved proposal slip (at Alangilan, this may also be done at the Computer Laboratory of Engineering);

4. Pay PTA, SSC, Insurance fees;

5. Pay tuition and other fees (cash or installation basis) at the Cashier’s Office;

6. Submit the approved proposal slip and secure final approval of registration form bearing the mark “ENROLLED”; and

7. Proceed to ID Room for lost ID card (if applicable).

Enrolment Procedure for Transferees and Shifters

1. Go to Dean’s Office or Academic Adviser or Department Head:
   a. Have your subjects taken be evaluated;
   b. Present admission slip from TAO, honorable dismissal, and certification of good moral character from last college attended (for transferees), or exit survey secured from the guidance office (for shifters); and
   c. Have your proposal slip approved.

2. In the Center for Student Services:
   a. Request for the printing of registration form upon presentation of approved proposal slip and assessment of fees;
   b. Pay PTA, SSCC/SSC, Insurance fees;
c. Pay tuition and other fees (cash and installment basis) at the Cashier’s Office;

d. Submit credentials (honorable dismissal, certification of graduation and good moral character from last college attended, NSO photocopy of birth certificate), clearance (for shifters) to and secure final approval of registration form bearing the mark “ENROLLED” and class cards from the Registrar’s Office; and

e. Proceed to ID Room for Identification Card (if applicable).

Accreditation of Subjects for Transferees

1. Subjects taken from State Colleges and Universities will be accredited based on the course descriptions of the subjects taken and corresponding number of units earned from the school of origin.

2. Subjects of transferees from private Colleges or Universities will be accredited based on the following guidelines:

   a. All applicants should pass the entrance examination to be conducted by the Testing and Admission Office (TAO).

   b. All applicants should be classified as freshman students.

   c. Final grades in the minor subjects to be accredited should be 2.5 and higher.

   d. Applicants in the major subjects to be accredited (i.e. Accounting, Economics, Statistics, Mathematics, Physics, Education and others) should pass the validating examinations to be conducted by the Testing and Admission Office (TAO).

Cross Enrolment

1. No student shall be allowed to cross-enroll in another institution without the approval of his respective Dean and Registrar.

2. The total study load for which a student may cross-enroll shall not exceed the maximum allowed by the rules on academic loading.

3. Cross-enrolment may be granted under the following conditions:

   a. The subjects are not offered in the mother school during the particular semester the student is enrolled.

   b. The subjects are offered but are in conflict with the other subjects of the student.

Procedure for Cross Enrolment
1. Secure a Cross Enrolment Form at the Registrar’s Office.

2. Fill up the form and indicate your reason/s for cross enrolment.

3. Have the form approved by your College Dean.

4. Seek the approval of the University Registrar.

5. Keep the Student’s Copy of the Cross Enrolment Form.

**Academic Load**

1. Full-time or regular student is allowed to carry the maximum load prescribed by his curriculum.

2. A part-time or regular student has to have his subject load approved by the Board of Advisers of his respective School or College before he or she is allowed to enroll.

3. Only graduating students are allowed to request for a subject overload per DECS Order No. 66 series 1988. No overload subjects shall be credited by the Registrar without approval referred to above.

**Prerequisite Subject Regulation**

During enrollment, the students acquire their grades from the enrollment committee or registrar and fills up a proposal slip for the subjects that the student will enroll for the next semester. The faculty assigned as evaluator verifies the students’ grades from the last semester, and checks if the students had already taken and passed pre-requisite subjects written in the evaluation sheet. The faculty evaluates the courses or subjects which the students enroll in the following semester using the prospectus or curriculum. For each student, all evaluation sheets are compiled and stored in the department’s databank. This is managed by the faculty assigned as student management lead. This is retrieved from time to time by the academic advisers for purposes of student progress monitoring.

Taking advance subject(s) may be allowed where the prerequisite subject is still not passed or still to be taken on the following cases: (1) the pre-requisite and the subject to be taken may not be offered for the regular class due to change of curriculum implementation, and (2) the student is a graduating one, the non-addition of the advance subject may lead to prolonging the residence time beyond the allowable maximum set by the Registrar.

1. As prescribed by the CHED, subjects taken and completed without satisfying the prescribed prerequisite will not be given credit regardless of the grade obtained.

2. A student who receives a conditional grade of 4.0 and Incomplete (Inc.) shall not be allowed to take its advanced subjects. The student must complete the grade in the prerequisite subject before he is allowed to take any of the advanced subjects.
Official Dropping, Changing or Adding Subjects

1. A student shall be allowed to change or add subjects provided that the class he intends to join has not held classes for more than nine (9) class hours, by filling out the necessary form at the Registrars Office.

2. A student who drops out of classes shall be marked “Dropped” whether he took the preliminary examination or not and irrespective of his preliminary grades. Dropping must be made official by accomplishing a dropping form duly signed by proper officials. The form must be submitted to the Registrar's Office before the mid-term examination as officially scheduled in the calendar.

3. A student who drops out of class after the midterm examination and whose midterm grade is 3.0 or above, shall be marked “Dropped”, if his midterm grade is lower than 3.0, he shall be given a grade of 5.0 If the student drops out within (2) weeks immediately preceding the final examinations, he shall be marked “4.0”.

Procedure for Adding, Dropping and Changing Of Subjects

1. Secure Adding, Changing or Dropping Form at the Registrar's Office before the scheduled midterm examinations.

2. Properly fill up the form indicating your reason/s for adding, changing, or dropping of subject/s.

3. Seek approval of the College dean, Accountant and the Registrar respectively.

4. File the approved Adding, Changing or Dropping Form at the Registrar's Office.

5. Keep the Student’s Copy of the form.

Petition Subject or Course Request

For cases that a student may need to take the course to complete the program with residency period, a petition shall be made. This petition letter should be signed by the students who would like to request for the course or subject to be offered for that semester. If the class who will petition is less than 15 students, the class is considered to be a tutorial, otherwise will be considered to be a special class.

The letter of petition shall be requested to the Dean for approval, with recommending approval by the Department Head. The Department Head will confirm the schedule and faculty who will be handling the course or subject to ensure the possibility of offering the course or subject for that semester. The letter of petition shall be attached with list of students who will petition, parent's consent of the students and program of study of the students (if required by the Dean or Department Head).
Once the letter of petition is fully accomplished by all the authorities concerned, a copy of the same should be provided to the Dean, the Department Head, and students who requested as attachment in their program of study which are included in the personal profile in the Chemical and Food Engineering Department database.

**Student Performance Evaluation**

As of 2010, the College of Engineering, Architecture, Fine Arts and Computing Sciences raised its standards of student evaluation to ensure uniformity in assessing the students’ performance in different courses and maintain the academic standard of the University through the efforts in implementing a grade system for different types of class.

Student performance evaluation includes the instructor’s evaluation based on the ratings of their assessment methods employed to achieve the intended learning outcomes and the student outcomes specific for the course. Rubrics of the student outcomes fit for each courses, indicating the performance indicators for each, guides the faculty in grading the level of attainment and is used in the evaluation using the requirements accomplished by the students as evidence of their level of achievement.

The intended learning outcomes of the students are evaluated depending on the course type such as pure lecture, lecture with wet laboratory, lecture with dry laboratory, and OJT. They are evaluated by percentages from the results of their performances in their four major examinations and other assessment methods. Some of the assessment methods aim for the student to engage and participate in classroom discussions which also considered their attendance to the course. This can be seen in Table 1. All scores of the examination usually are to be transmuted to 75% scale equivalent to the overall passing cut-off of 60% of the total transmuted (raw) grade. Most of the instructors consider giving removal examination for students who attained 70-74% transmuted grade.

<table>
<thead>
<tr>
<th>Course Type</th>
<th>Grading System</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Pure Lecture</td>
<td></td>
</tr>
<tr>
<td>a. Professional Subjects</td>
<td>80% A + 20% B</td>
</tr>
<tr>
<td>b. General Education</td>
<td></td>
</tr>
<tr>
<td>1. Languages, Social Sciences, Literature</td>
<td>60% A + 40% B</td>
</tr>
<tr>
<td>2. Mathematics</td>
<td>80% A + 20% B</td>
</tr>
<tr>
<td>II. Drawing</td>
<td>80% T + 20% B</td>
</tr>
<tr>
<td>III. Subjects with Laboratory</td>
<td>60% A + 30% L + 10% B</td>
</tr>
</tbody>
</table>
IV. Pure Design Subjects
40% A + 50% D + 10% B

V. Professional Subjects (with project design output)
60% A + 30% D + 10% B

VI. Research Methods

a. Pure Lecture
80% A + 20% B

b. Lecture with Proposal Output
40% A + 50% P + 10% B

VII. Project Study (Thesis, Feasibility Studies)
60% PO + 40% P

Legend

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Exams Average Grade</td>
</tr>
<tr>
<td>B</td>
<td>Class Standing (Attendance, Assignments, Seat works)</td>
</tr>
<tr>
<td>L</td>
<td>Laboratory Average Grade</td>
</tr>
<tr>
<td>D</td>
<td>Design Average Grade</td>
</tr>
<tr>
<td>PO</td>
<td>Project Output/ Prototype Grade</td>
</tr>
<tr>
<td>P</td>
<td>Presentation Grade</td>
</tr>
<tr>
<td>T</td>
<td>Drawing Plates Average Grade</td>
</tr>
</tbody>
</table>

Grading System

<table>
<thead>
<tr>
<th>Numerical Grade</th>
<th>Percentage Equivalent</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00</td>
<td>98-100</td>
<td>Excellent</td>
</tr>
<tr>
<td>1.25</td>
<td>94-97</td>
<td>Superior</td>
</tr>
<tr>
<td>1.50</td>
<td>90-93</td>
<td>Very Good</td>
</tr>
<tr>
<td>1.75</td>
<td>88-89</td>
<td>Good</td>
</tr>
<tr>
<td>2.00</td>
<td>85-87</td>
<td>Meritorious</td>
</tr>
<tr>
<td>2.25</td>
<td>83-84</td>
<td>Very Satisfactory</td>
</tr>
<tr>
<td>2.50</td>
<td>80-82</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>2.75</td>
<td>78-79</td>
<td>Fairly Satisfactory</td>
</tr>
<tr>
<td>3.00</td>
<td>75-77</td>
<td>Passing</td>
</tr>
<tr>
<td>4.00</td>
<td>70-74</td>
<td>Conditional Failure</td>
</tr>
<tr>
<td>5.00</td>
<td>Below 70</td>
<td>Failure</td>
</tr>
<tr>
<td>Inc.</td>
<td></td>
<td>Incomplete</td>
</tr>
</tbody>
</table>

- A student is given a grade of “Incomplete” if his class standing is passing but fails to take examination or fails to submit the requirements of the course at a specified period due to illness or other valid reasons.

- A grade of “Incomplete” must be completed within one (1) year/ two (2) semesters. A student who fails to complete the deficiency/ deficiencies at the end of one year shall automatically obtain a grade of 5.0 in the subject. A grade of 4.0 or conditional failure in any subject must be removed within the next semester.
Student Progress Monitoring

Academic Advising

The Food Engineering Department provides each student a permanent adviser, who guides and coaches the students in their academics. The academic advisers function to monitor the students’ progress assigned to them, provide academic advising to the students, and relay to the Department (through the Student Management Lead) the progress of each student to devise action plans or revision of policies that augment the development of the students’ academic performance. Prior to enrollment, the Department is advised of the students’ performance serving as basis in determining the provision or recommendation of possible tutorial classes for self-help for each student, and project possible petition classes for the next semester. Faculty advisers, together with the ChE department chairman, deliberate periodically the academic progress of every specific group of students assigned to each faculty adviser.

Student Outcomes Monitoring

At the end of each semester, the instructor in charge of the class conduct student outcomes assessment, to check the level of achievement of the student outcomes proper for the specific class or course. The results from this assessment serve as the basis for the development of the teaching and learning strategies, the manner of adapting the teaching and learning strategies for the next course related to the subject at hand, and in choosing the proper evaluation techniques that is effective in gauging the student outcomes for the improvement of the students’ performance.

Student Classification Based on Performance

Students who are on track with the curriculum based on her or his students’ performances are considered regular students otherwise those with failed grades and are not on track with the curriculum are considered irregular students. For irregular students, they are advised to make a program of study where the stipulations of which indicates the semester and year to which the remaining courses are to be taken. This is evaluated by the academic adviser or instructor in charge during the enrollment and approved by the Program Chair or Department Head.

Advising and Career Guidance

The Department usually conducts on the first day of school every semester a preliminary orientation for the students and parents to inform about the requirements needed for the completion of the program and the things that the students will learn from the program. During this orientation, the parents are informed on the hurdles their daughters and sons may be encountering for them to be prepared on the challenges they may encounter.
The chairman of the department acts as the overall adviser of the students where the major decisions regarding the academic performance evaluation are considered and some of the decision that student organization is concerned with as extra-curricular activities. The students are encouraged to engage in quiz shows, conventions and assemblies that will further enhance the students’ academic progress. The University provides, at the end of the semester for the students under the last year level, career guidance through the initiative of the Office of Guidance and Counseling. Alongside with the career guidance the IACEPO provides Job Fair for possible application of newly graduates and the alumni who might be interested in applying.

**Career Advising**

Career orientation seminar is provided for second year general engineering students before taking their Engineering Classification Test (ECT) exam to help the students decide on the possible career paths in the field of engineering to which they may be interested with.

The Industry Academe Cooperative Education Program Office (IACEPO), with the department coordinator, conducts an on-the-job training seminar for students who will undergo training to different local or international companies. IACEPO provide students the background, rules and regulation on the OJT implementation; and information regarding the company chosen. A job fair is also catered by the IACEPO for graduating students and alumni.

The Guidance and Counseling of the University provides the psychological needs of the students regarding academics, social and personal activities.

The academic adviser plays the function in monitoring the students’ progress, in providing academic advising and career guidance. The academic adviser provides some tips and work background on the field of specialization that the students would like in the future to undergo and gives consultation when problems arises on some of the projects and assigned works the student are handling in their academics. The adviser also provides tips on what particular companies are advisable to take for their on-the-job trainings that will enhance their engineering knowledge, capabilities and will gain expertise.

**Academic Advising**

Each student is assigned with faculty academic advisers who will monitor the students’ progress, coach the students for academic improvements and inform the Department to summarize the performance of the class or the batch. The students can seek counsel and advise regarding their studies, project designs, and researches. The monitoring of the students’ progress throughout their stay in the program is monitored by the student management lead. All issues pertaining to the students’ progress are informed to all faculty concerned and the department chair for monitoring. A form is provided for academic advising. Academic advising is different from class advising wherein consultation are provided and indicated in the Syllabus provided in their respective subject loading.

Students are asked to fill up the student profile and compile all documents to be kept in the Department’s databank for safe keeping by the Student Management Lead (Faculty Member). Documents include the student profile, ECT interview and exam results, OJT accomplishment
reports, academic advising consultations, program of study (irregular student) and the individual evaluation sheet duly accomplished every semester.

During the enrollment, the faculty-in-charge evaluates the grades and notes it to the evaluation form that will serve as guide for the monitoring of grades. Any irregularities in the students’ performance are informed to the Department Chair and to be informed to the respective academic advisers. In case of failure of grades, a program of study is made by the students with the help of the academic adviser(s) or the department chair to complete the requirements of the program within six (6) year maximum retention policy.

Residency Requirement

1. Students who are enrolled in any five-year course should finish the course within five to six (5 to 6) years period; and

2. Students who are enrolled in any four-year course should finish the course within four to five (4 to 5 years).

3. The same is applied to shifters and students who have their OJT abroad.

Graduation Requirement

1. A candidate for graduation must satisfy the following requirements:

1.1. He must complete all academic and non-academic requirements of the course.

1.2. He must fill – up and submit Application for Graduation form at the Registrar’s Office during the last semester in school.

1.3. His school records must be completed and in order at the time of application and final evaluation of credits.

1.4. He must be cleared from all money, property and school accountabilities.

Guidelines for the Selection of Honor Students for Undergraduates

1. Residency

1.1. Students who are candidates for graduation with honors must have completed in the Batangas State University at least 50% of the total number of academic and shop units
required for graduation and must have been in continuous residence in the university for at least three (3) years for a five-year course and two and a half (2.5) years for a four-year course.

1.2. Students who shifted from one course to another must have completed at least 50% of the total number of academic units required in the present course and must have been in continuous residence in the present course.

2. Load and Grade Requirements

2.1. Students who are candidates for graduation with honors must have taken during each semester not less than fifteen (15) units of credits, or the normal load prescribed in the curriculum. In cases where such normal load is less than fifteen (15) units, and the taking of a lighter load was due to justifiable causes, such as, for instance, for reason of health or due to the act that the candidate was a working student, the reason must as much as possible be certified to by the proper authority at the time the underload was incurred.

2.2. In the computation of the general weighted average (GWA) of students who are candidates for graduation with honors, all credits except NSTP, OJT, ENGLISH 101-A (formerly English 100) and MATH 100, will be included. OJT is not included in the computation since it is by nature an industrial training where the issuance of grade does not follow specific/systematic standard. Grades in RESEARCH 102, though adjectival should also be included in the computation considering its numerical equivalent.

2.3. Students enrolled in any five-year and four-year courses who have met the required grades and general weighted average (GWA) may be awarded honors as follows:

Summa Cum Laude – lowest grade must be 1.5 (90-93); general weighted average is 1.0 – 1.25. He/she should not have received a grade of 4.0 or INC. even in subjects not included in the computation of the GWA; did not drop, officially or unofficially any of his/her subjects and should not have failing grades.

Magna Cum Laude – lowest grade must be 1.75 (88-89); general weighted average is 1.25 – 1.5. He/she should not have received a grade of 4.0 or INC. even in subjects not included in the computation of the GWA; did not drop, officially or unofficially any of his/her subjects and should not have failing grades.

Cum Laude – lowest grade must be 2.0 (85-87); general weighted average is 1.51 – 1.75. He/she should not have received a grade of 4.0 or INC. even in subjects not included in the computation of the GWA; did not drop, officially or unofficially any of his/her subjects and should not have failing grades.

Outstanding – lowest grade must be 2.25 (83-84); general weighted average is 1.99. He/she should not have received a grade of 4.0 or INC. even in subjects not included in the computation of the GWA; did not drop, officially or unofficially any of his/her subjects and should not have failing grades. This award will be given only when no one among the graduating students qualifies in the aforementioned honors.

2.4. Dropping of subjects due to the Department’s/School’s policy (the subject was dissolved; the subject was offered during enrollment period but was withdrawn later; and other
similar reasons) will not disqualify any student for honors provided that the College Dean will issue certification attesting to the directness of the reason.

2.5. In the case of transferees and shifters, his/her grades in the previous school/course will be included in the computation of his/her general weighted average (GWA). Grades from the previous school will be converted to the BSU grading system.

**Special Awards for Graduating Students**

1. Loyalty awards may be given to students who have completed their schooling in BSU from first year secondary to college.

2. The Batangas State University Award of Academic Excellence, consisting of a gold medal, is awarded to the student taking a five-year course who has satisfied the following requirements:

   2.1. He must have had at least four successive years of residence in the university.

   2.2. He must have obtained grades not lower than 2.5.

   2.3. He must have a good moral character, he must not have a record of any disciplinary punishment during his stay in the university.

3. The University President Award of Academic Excellence consisting of a gold medal is awarded to a student taking a four-year course who has at least three successive years of residence and has satisfied the same requirements for academic and moral status as those required of the recipients of the Batangas State University Award of Academic Excellence.

**Procedure for Application for Graduation**

1. Have the scheduled preliminary evaluation of subjects taken at the Registrar's Office at least one semester before graduation.

2. Undergo final evaluation scheduled by the Registrar's Office.

3. Fill up an Application Form for graduation.

4. Have the form approved by the instructors of subjects you are presently taking and then have it signed by the College Dean.

5. File the Application Form at the Registrar's Office.

**Procedure for Securing Certifications, Transcript of Records and Diplomas**
1. Secure clearance form and request slip from the Registrar’s Office. Fill up the clearance form and have it signed by the College Dean and the Accountant.

2. Pay the amount indicated in the request slip at the Cashier’s Office.

3. File the Official Receipt (OR) and clearance form at the Registrar’s Office.

4. All form of Certification may be issued upon submission of the OR and clearance form at the Registrar’s Office, Transcripts of Records and Diplomas on the other hand may take two to three processing days.

**Procedure for Transfer Credentials / Honorable Dismissal**

1. Have your exit interview at the Office of Student Affairs.

2. Secure clearance form and request slip from the Registrar’s Office. Properly fill-up the clearance form and have it signed by the College Dean and the Accountant.

3. Pay the amount indicated in the request slip at the Cashier’s Office.

4. Submit the Official Receipt and the clearance form at the Registrar’s Office.

Transfer Credentials / Honorable Dismissal can be claimed upon submission of OR and clearance form if Form 137A or Transcript of Records is already submitted at the Registrar’s Office. If form 137A is NOT yet submitted to the Registrar’s Office, the student should submit the needed request form for such form to the school where he last attended.

**Fees, Permits and Clearances for Undergraduate**

**Payment of Fees**

Tuition and other fees may be paid on cash or on installment basis. Under the installment basis, students will pay an amount as down payment at the time of reenrollment and the balance in equal installments one week before each periodic examination, amounts of which will be determined by the Assessment Section of the Accounting Office. All payments shall be receipted at the Cashier’s Office.

**Table 2**

<table>
<thead>
<tr>
<th>Schedule of Fees</th>
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<tbody>
<tr>
<td>Nursing</td>
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<tr>
<td>Nursing</td>
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<td></td>
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<tr>
<td>----------------</td>
</tr>
<tr>
<td><strong>MISCELLANEOUS FEES:</strong></td>
</tr>
<tr>
<td><strong>REGISTRATION FEE</strong></td>
</tr>
<tr>
<td><strong>LIBRARY</strong></td>
</tr>
<tr>
<td><strong>ATHLETIC</strong></td>
</tr>
<tr>
<td><strong>PUBLICATION</strong></td>
</tr>
<tr>
<td><strong>MEDICAL &amp; DENTAL</strong></td>
</tr>
<tr>
<td><strong>GUIDANCE &amp; COUNSELING</strong></td>
</tr>
</tbody>
</table>

**Dropping / Refund**

If a student officially drops a subject or all his/her subjects as the case maybe:

1. Before the start of classes, he/she will pay registration fees only;

2. Within one month after opening of classes, he/she will pay 25% tuition and 50% miscellaneous fees;

3. Before the midterm, 50% tuition and 100% miscellaneous fees;

4. After the midterm, 100% of all fees.

5. If he/she paid on cash basis, he/she is entitled to a refund in accordance with the above.

**Examination Permit**

We have the policy “No Permit, No Examination”, Students should pay their dues at least one week before each examination period in order for them to secure their permits by having their forms validated at the Cashier’s Office upon payment.

**Clearance**

Students must be cleared of all financial obligations one week after the last day of classes.
Chemical and Food Engineering Department

The Chemical and Food Engineering Department is composed of faculty members and students who work hand in hand to achieve quality education to the students through instruction, research, extension services and production provided in the curriculum and as accomplished by the extra-curricular activities conducted by the student organization. The main goal is to provide quality education and produce morally upright Chemical and Food Engineers.

The Department has four (4) core faculty for the BS Food Engineering program and 7 core faculty for the BS Chemical Engineering program. For some allied and general engineering courses, the faculty for the BS Food Engineering program also handle subjects and courses for the BS Chemical Engineering and vice versa. There is one laboratory coordinator who manages the activities of the two laboratory technicians in charge in the management of the Chemistry and Food Laboratory, and Unit Operations Laboratory. Usually the third to fifth year level for the BS Food Engineering program has one (1) section, while 1-2 sections for the same levels for the BS Chemical Engineering program.
### Faculty Profile

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Roles/Committees</th>
<th>Education</th>
<th>Specialization</th>
<th>Courses / Subjects Handled</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DR. ELISA D. GUTIERREZ</strong></td>
<td>Dean, CEAFA</td>
<td>CEAFA Dean, Alangilan Campus, Graduate School Coordinator, Assistant Director for Research – EST</td>
<td>Doctor of Technology (BatStateU), Master of Arts and Teaching Science (PBMIT), BS Chemical Engineering (FEU)</td>
<td>Biofuels, Materials and Environmental Engineering</td>
<td>Organic Chemistry, Biotechnology and Biochemical Engineering</td>
</tr>
<tr>
<td><strong>DR. ERMA B. QUINAY</strong></td>
<td>Vice President for Research, Development and Extension</td>
<td>ASEAN Engineer, Faculty Researcher, Continuous Quality Improvement (CQI) Committee Chair, Research and Extension Committee Co-Chair</td>
<td>Doctor in Business Administration (AHUSC, California, USA), MST Chemistry (DLSU), BS Chemical Engineering (UST)</td>
<td>Environmental Quality Monitoring and Engineering, Food Processing</td>
<td>Safety, Laws and Ethics, Management, Methods of Research, ChE Project, and Instrumental Method of Analysis</td>
</tr>
<tr>
<td><strong>DR. SHIRLEY G. CABRERA</strong></td>
<td>Director, Research and Development</td>
<td>Faculty Researcher, Associate Professor I</td>
<td>PhD in Food Science and Technology graduate (KNU, South Korea), MS Food Engineering graduate (UNSU, Australia), BS Food Technology graduate (UPLB)</td>
<td>Fruit Juice Processing, Food Processing, Food Safety, and Food Technology</td>
<td>Biological Science, Biochemistry and Technical Analysis of Foods, Food Chemistry, and general Microbiology</td>
</tr>
<tr>
<td><strong>ENGR. MARY ROSE F. PERSINCULA</strong></td>
<td>Department Head, Chemical and Food Engineering Program Educational Objectives (PEO) Committee Chair</td>
<td>Faculty Researcher, Assistant Professor IV</td>
<td>Master of Science in Chemical Engineering (UPDil), BS Chemical Engineering (BatStateU)</td>
<td>Biofuels, Equipment Prototype Development, Environmental Engineering</td>
<td>Equipment Design, Chemical Reaction Engineering and Kinetics, Environmental Engineering, Transport Phenomena, Thermodynamics and Calculations</td>
</tr>
<tr>
<td>Name</td>
<td>Position</td>
<td>Education</td>
<td>Specialization</td>
<td>Courses/Subjects Handled</td>
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</tr>
<tr>
<td><strong>ENGR. MARIELLI KATHERINE C. UNTALAN</strong></td>
<td>Research and Extension Committee Chair</td>
<td>Masters in Business Administration (BatStateU), BS Food Engineering (BatStateU)</td>
<td>Food Processing, Food Packaging and Labelling, Food Safety, and Food Technology</td>
<td>Food Microbiology, Food Processing, Food Packaging and Labelling, Sensory Evaluation and Product Development, Food Safety, and Food Process Industries</td>
<td></td>
</tr>
<tr>
<td><strong>ENGR. KRISTINE MAY H. ESCALONA</strong></td>
<td>Adviser, AFES</td>
<td>BS Food Engineering (BatStateU)</td>
<td>Technical Analysis of Food</td>
<td>Food Processing, Analytical Chemistry for FE, Physical Chemistry for FE, Biochemistry, Unit Operations, Organic Chemistry</td>
<td></td>
</tr>
<tr>
<td><strong>ENGR. MACEY A. MAHAWAN</strong></td>
<td>Instructor I</td>
<td>BS Food Engineering (BatStateU)</td>
<td>Technical Analysis of Food</td>
<td>Statics and Dynamics of Rigid Bodies, Mechanics of Deformable Bodies, Differential Equation, Unit Operations, Statistics and Probability</td>
<td></td>
</tr>
<tr>
<td><strong>DR. SICILY B. TIU</strong></td>
<td>Head, Guidance and Counseling</td>
<td>Doctor of Philosophy in Chemical Engineering (UPDil), Master in Business Administration (PBMIT), BS Chemical Engineering (PLM)</td>
<td>Material Science, and Environmental Engineering</td>
<td>Laws and Ethics, Materials, Technopreneurship, Management</td>
<td></td>
</tr>
</tbody>
</table>
**ENGR. RHONALYN V. MAULION**  
Student Management Committee Chair  
Student Outcomes (SO) Committee Chair  
Co-Adviser, PIChE-JCB  
Instructor I  
Master in Chemistry (BatStateU), BS Chemical Engineering (BatStateU)  
Specialization: Material Science, Environmental Engineering, and Biofuels  

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**ENGR. REJIE C. MAGNAYE**  
Adviser, PIChE-JCB  
Coach, Quiz Team of ChE  
Instructor I  
Master of Engineering, Major in Chemical Engineering (BatStateU), with units; BS Chemical Engineering graduate (BatStateU)  
Specialization: Biofuels, Equipment Prototype Development and Environmental Engineering  
Courses/ Subjects Handled: Unit Operations, Statics and Dynamics of Rigid Bodies, Differential Equation, Mechanics of Deformable Bodies, ChE Calculations II

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**ENGR. MA. FRANCIA N. TENORIO**  
Laboratory Technician, Chemistry Laboratory  
Support Faculty – Part Time  
BS Food Engineering graduate (BatStateU)

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**Laboratory Capability**

The Chemical and Food Engineering Laboratories provide students with the opportunity to conduct the laboratory experiments intended for the courses under the BS Chemical Engineering and BS Food Engineering programs (Analytical Chemistry, Organic Chemistry, Inorganic Chemistry, Physical Chemistry, Environmental Engineering, Food Analysis and Processing). There are four laboratories: Chemistry Laboratory, Instrumentation Laboratory, Food Laboratory and Unit Operations Laboratory. In the Chemistry Laboratory, students can perform experiments such as titration, proximate
analysis (ash and moisture), distillation, pH determination, melting and boiling point determination, chromatography, and determination of properties of organic compounds. In the Instrumentation Laboratory, all the equipments are placed in this laboratory and may be use for laboratory experiments and research experiment. The Food Laboratory is intended for the BSFE program which is used also for Food related research for the BS ChE program. The Unit Operations Laboratory is equipped with prototypes made by the students, size reduction equipments, sieve shaker, packed distillation tower, fractional distillation setup, electric distillation setup, Reynold’s Number, pipes, fittings and friction losses demonstration setup, packed bed or fluidized bed setup, sedimentation demonstration apparatus, solvent extraction setup, wetted wall column, double pipe heat exchanger, dryer, plate and frame filter press, agitation tank, conduction demonstration apparatus, boiler, and cooling tower.

The laboratories are equipped with instruments such as:

- Analytical Balance
- Waterbath shaker
- Oven
- pH meter
- Furnace
- Centrifuge
- Microscope
- Agitator
- Heating mantle
- Rotary Evaporator
- Candy thermometer
- Microscope
- Oven
- Vacuum Filtration Apparatus

### Student Organization

The student organization seeks to accelerate knowledge for the upliftment of educational standard in the field of food engineering. The group develops every member into a critical thinker and responsible human. It aims to produce successful food engineers who have social conscience and respect for nature and to provide the technical needs of our highly industrializing region.

The Association of Food Engineering Students, a sole organization of Food Engineering students nationwide, is a college-based organization that aims to promote the profession in the field of academics, extension, research and even production preparing them for their future Food Engineering profession. They uphold the following:

### MISSION

Association of Food Engineering Students inspired by its vision and with the help of the Almighty God, the University and Chemical and Food Engineering Department, will secure its name, abide in its constitution and by-laws, and support the growth of its members by instilling values of learning and solidarity cooperating in school activities, providing new ideas in the field of research and development, and delivering appropriate and beneficial extension in the best of its ability to fulfill its duties and responsibilities for the betterment of the students, the department and college, the university and of the country.
VISION

The Association of Food Engineering Students envisions to be a leading college organization that creates an avenue for promoting excellence, leadership and sense of responsibility of its members contributing to the applications of food engineering profession.

PHILOSOPHY

Bringing Engineering to Life.
BS Food Engineering Program

Food engineering is a multidisciplinary field of applied physical sciences which combines science, microbiology, and engineering education for food and related industries. Food engineering includes, but is not limited to, the application of agricultural engineering and chemical engineering principles to food materials. Food engineers provide the technological knowledge transfer essential to the cost-effective production and commercialization of food products and services.

Food Engineering provides the students with an engineering education directed toward the application of modern science and engineering to the process, manufacture, preservation and distribution of food products. The theoretical and practical aspects of food industry ranging from the quality of raw materials to the final usage of products by consumers are the main concerns of food engineering.

Food Engineering is a very wide field of activities. Prospective major employers for food engineers include companies involved in food processing, food machinery, packaging, ingredient manufacturing, instrumentation, and control. Firms that design and build food processing plants, consulting firms, government agencies, pharmaceutical companies, and health-care firms hire food engineers. Among its domain of knowledge and action are:

- research and development of new foods, biological and pharmaceutical products
- development and operation of manufacturing, packaging and distributing systems for drug/food products
- design and installation of food/biological/pharmaceutical production processes

Program Description

The BS Food Engineering (BSFE) Program started offering in 1996 and in 1999 it was transferred to the Schools of Foods and International Hospitality Management. Then it was transferred back again to the College of Engineering, Architecture and Fine Arts under the Chemical and Food Engineering Department in 2006.

The program is designed to equipped its graduates for the Food Engineering profession in various activities ranging from conceptualization of industrial plants may it be new or an innovation, management of waste and water treatment facilities, total quality management, project management, teaching and or training of personnel, research and development, private consulting,
and public service. The program equipped its graduates through emphasis on fundamental principles, laboratory and computing skills, and lifelong learning. The program continually provides quality education through instruction, research activities and extension services that can be manifested in the students’ active participation in academic and research competition, students’ organization extra-curricular works and faculty’s commitment in research activities and extension services. The program continually provides quality education through instruction, research activities and extension services that can be manifested in the students’ active participation in academic and research competition, students’ organization extra-curricular works and faculty’s commitment in research activities and extension services.

**Program Educational Objectives**

The alumni three to five years after graduation shall:

- be at the forefront of advancing technology in line with food and shall have knowledge and skills on, process design, process modeling, simulation and control, cleaning of food process plant; designing of cost-effective food process machinery, developing of food products and value-added food products, and developing of new technologies on thermal and non-thermal processing of foods.

- develop new post-harvest processing industry machinery for the production and harvesting of raw materials for food and drinks with the application of precision technology

- develop new processing techniques and methods, efficient system and equipment to process, handle and package foodstuff to ensure quality and safety of products

- ensure the safest and most environmentally friendly ways of processing, packaging, preserving and storing foods for distribution

**Student Outcomes**

The graduate from the program should possess the following:

- Ability to apply knowledge of mathematics and science to solve engineering problems

- Ability to design and conduct experiments, as well as to analyze and interpret data

- Ability to design a system, component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability, in accordance with standards.

- Ability to function on multidisciplinary teams

- Ability to identify, formulate and solve engineering problems
• Understanding of professional and ethical responsibility

• Ability to communicate effectively

• Broad education necessary to understand the impact of engineering solutions in a global economic, environmental and societal context.

• Recognition of the need for and an ability to engage in life-long learning

• Knowledge of contemporary issues

• Ability to use techniques, skills and modern engineering tools necessary for engineering practice.

• Knowledge and understanding of engineering and management principles as a member and leader in a team, to manage projects and in multidisciplinary environments.
Teaching, Learning and Assessment Methods

The most common teaching and learning strategies used by the instructor in the program are lecture, discussion, oral recitation, demonstration, reporting, team or cooperative teaching, panel presentation, problem-solving, exercises, assignment, research, projects, active learning, experiential learning, field trips, seminar, use of lecture and laboratory manual or guide, narrative report, on-the-job training, experiments, self-video, notebook, poster making, case studies, use of chalkboard by instructor as aid in teaching, use of diagrams, tables, graphs, and charts by instructor in teaching, use of exhibits and displays by students, use of slides, use laboratory manual, lecture guide or manuals, peer teaching, team teaching, take home tests, narrative reports, brainstorming, inquiry learning, problem based learning.

Other teaching and learning strategies employed by the faculty members for their courses in the program are lecture demonstration, lecture demonstration by another instructor, class discussion, discussion groups, individual reports, group reports, debate, role playing, task oriented group work, textbook assignment, reading journal assignment, assignment to outline portions of the textbook, assignment to outline certain supplementary readings, crossword puzzle, term paper, reports on published research studies, library research, jigsaw puzzle, gaming and simulation, interview, models, open textbook study, class projects, individual projects, quiz-down gaming, laboratory experiments, use of dramatization, skits and plays, student construction of graphs, diagrams, or charts, use of filmstrips, use of educational films, service projects, use of community or local resources, survey, tutorial, coaching, oral reports, application of statistical techniques, non directive techniques, supervised study, use of technology and instructional resources, open textbook tests, discovery learning, active experimentation, reflective observation, cooperative learning, just-in time teaching, project-based learning, case-based instruction, inductive teaching and learning, presentation, workshop, design projects, quiz, question and answer, quiz shows, concept design, prototype design, experiment design, research, class room exercises, process and product valuation, synthesis of new product or process, activity learning, and machine problem solving.

Student performance evaluation includes the teacher’s evaluation based on the student learning quality for the achievement of the intended learning outcomes and that intended to address the student outcomes specific for the course. The students are evaluated depending on the course type such as pure lecture, lecture with wet laboratory, lecture with dry laboratory, and OJT. They are evaluated by percentages from the results of their performances in their four major examinations and other assessment methods. Some of the assessment methods aim for the student to engage and participate in classroom discussions which also considered their attendance to the course.

For the achievement of the intended learning outcomes the assessment methods employed are: homework assignments, quizzes, exams, class attendance, design project, laboratory written reports, laboratory oral presentation, design project oral presentation, research presentation, thesis, computer simulation, prototype development, laboratory testing, experiments, project team work, case study, paper critique, presentation, modeling and simulation, problem sets, exercises, narrative report, training assessment, and oral presentation.
The students are evaluated by the faculty employing four major exams that are given periodically and scheduled by the Registrar and/or VPAA. The exam includes problem solving, multiple choice, identification, enumeration, and essay. Quizzes may be given at the end of every topic. Most of the courses require homework, class room exercises and problem sets by the faculty after every topic.

Laboratory experiments are required to be accomplished in every course, with laboratory, together with laboratory experiment report and practicum or laboratory exam after each accomplished experiment of a given topic done inside the campus or at field. The laboratory provided is categorized as dry and wet laboratory. Dry laboratory are included in some courses with computer related works or paper research related output as requirement in the class. Some courses have wet laboratory wherein an experimental type of requirement using the Chemical Engineering, General Chemistry, Analytical Chemistry and Unit Operations Laboratory are being conducted.

Design projects and thesis or research projects are required to be accomplished in Methods of Research, FE Project1, FE Project 2, Plant Design 1 and Plant Design 2 and is evaluated by a defense panel compose of F E faculty members. Some faculty also requires design and research projects as laboratory or assignments for the laboratory and lecture type of courses.

For the OJT, the students are required to submit their narrative learning experience report, journal and other pertinent documents to the IACEPO and the ChE-FE Department for monitoring of their activities and serve as information for evaluation on the achievement of SO, PEO and even the requirements of the program as a whole to meet the demands of the industry. In addition, they are asked to ensure the accomplishment of the alumni survey and employer survey used for the continuous improvement.

For the assessment on the achievement of student outcomes, rubrics for each of the student outcomes (SO) fit for each courses are made indicating the performance indicators. These rubrics guide the faculty in grading the level of attainment of SO using the requirements accomplished for the assessment of student learning quality by the students as evidence. The evaluation of the assessment methods employed for the attainment of intended learning outcomes are used to evaluate the level of attainment of the SO and PEO.
## Curriculum

### General Engineering Curriculum
(Effective 2012-2013)

<table>
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<tr>
<th>Course Code</th>
<th>Course Description</th>
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### Higher Engineering Curriculum
(Effective 2014-2015)

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<td>17</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Description</th>
<th>Credit Units</th>
<th>Lecture</th>
<th>Lab</th>
<th>Pre/Co-requisite/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>OJT 500</td>
<td>Internship Training</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>Regular Standing</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**Course Descriptions**

**GENERAL ENGINEERING**

**First Year, First Semester**

Course Code : Chem 102  
Course Title : General Chemistry  
Credit Units : 4 units  
Credit Hours : 3 hours lecture, 3 hours laboratory  
Pre/Co-requisite : None

This course emphasizes the development and importance of chemistry, modern theories of atoms and its structures, chemical bonding, chemical formula, types of chemical reactions, redox reactions and stoichiometry. This subject also includes a detailed discussion of the
states of matter and mole concept. The course also features activities and laboratory experiments to observe the concepts taken and to acquire knowledge in chemistry necessary for solving many types of chemistry related problems and processes. This course offers an opportunity for students to relate the laws and principles of chemistry in actual industrial processes, operations and its implications to environment. It also aims to imbibe students to be conscious of the reality of chemistry in everyday life.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Eng 101</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Title</td>
<td>Advanced Grammar and Composition</td>
</tr>
<tr>
<td>Credit Units</td>
<td>3 units</td>
</tr>
<tr>
<td>Credit Hours</td>
<td>3 hours lecture</td>
</tr>
<tr>
<td>Pre/Co-requisite</td>
<td>For EPT Passers</td>
</tr>
</tbody>
</table>

It specifically focuses on the study of those systems and patterns that operate in English language which give meaning to an utterance. It provides an in-depth study on grammar rules and application of them to develop the linguistic as well as the communicative competence of students which will help them to cope with their academic work and the demands of the outside world. Grounded on comprehensive instruction and the frequent use of illustrative materials as well as practice exercises, it is hoped that the established usage – of what is preferred among educated or cultivated speakers and writers – will be gained.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Fil 101</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Title</td>
<td>Komunikasyon sa Akademikong Pilipino</td>
</tr>
<tr>
<td>Credit Units</td>
<td>3 units</td>
</tr>
<tr>
<td>Credit Hours</td>
<td>3 hours lecture</td>
</tr>
<tr>
<td>Pre/Co-requisite</td>
<td>None</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Course Code</th>
<th>Math 104</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Title</td>
<td>Advanced Algebra</td>
</tr>
<tr>
<td>Credit Units</td>
<td>5 units</td>
</tr>
<tr>
<td>Credit Hours</td>
<td>5 hours lecture</td>
</tr>
<tr>
<td>Pre/Co-requisite</td>
<td>None</td>
</tr>
</tbody>
</table>

This course offers mathematical concepts and algebra skills. Includes a brief review of intermediate algebra, polynomials, rational exponents and radicals, equations and inequalities, functions and their graphs, exponential and logarithmic functions, linear and non-linear systems, selection of topics from among graphing of the conic sections, introduction to sequences and series, permutations and combinations, the binomial theorem, and theory of equations. Also covers, matrices and determinants; arithmetic and geometric series; solution sets of different types of inequalities and systems involving quadratics; solution of linear equations using determinants and matrices.
Course Code : Math 108
Course Title : Plane and Spherical Trigonometry
Credit Units : 3 units
Credit Hours : 3 hours lecture
Pre/Co-requisite : None

The course covers the basic concepts and the study of trigonometry or Trigonometric functions and identities and conditional equations, circular functions, solutions on right and oblique triangles, ideas and formulas of spherical trigonometry, and solutions of spherical triangles.

Course Code : PE 101
Course Title : Physical Fitness, Gymnastics and Aerobics
Credit Units : 2 units
Credit Hours : 2 hours lecture
Pre/Co-requisite : None

This course deals with the meaning, components, benefits and scientific basis of physical fitness, as well as the administration of physical fitness tests. It also includes basic gymnastic skills and aerobic activities which are designed to develop the physical fitness of students.

Course Code : SS 101
Course Title : General Psychology
Credit Units : 3 units
Credit Hours : 3 hours lecture
Pre/Co-requisite : None

Knowledge on the various psychological theories and approaches is essential towards a better understanding and appreciation not of oneself but other people as well. Through this course, students are provided with understanding and knowledge on how to resolve problems and to develop great personal efficiency. Psychology tries to provide an environment wherein cognitive learning is interspersed and supported with affective class activities in the hope of developing one’s individuality.

First Year, Second Semester

Course Code : Chem 103
Course Title : Chemistry Calculation with Organic Chemistry
Credit Units : 3 units
Credit Hours : 3 hours lecture
Pre/Co-requisite : Chem 102

This course is a continuation of General Chemistry. This emphasizes topics on the basic concepts of solutions, thermodynamics, kinetics and equilibria, descriptive chemistry of elements as well as the introduction to electrochemistry, nuclear chemistry and organic chemistry. It also includes nomenclature of organic compounds. This course will not only
enhance the students understanding of the basic principles of chemistry but will also develop in them analytical thinking, environmental awareness and critical thinking as well.

Course Code : Draw 101  
Course Title : Engineering Drawing  
Credit Units : 1 unit  
Credit Hours : 3 hours laboratory  
Pre/Co-requisite : None

This course deals with the study and practice of the basic general engineering lettering, instrumental figures and geometric construction. It also involves the proper use of the engineering drawing instruments. Topics also taken up are basic techniques in dimensioning of figures; develop orthographic views, isometric drawing and vice versa and developing perspective.

Course Code : Eng 102  
Course Title : Study and Thinking Skills  
Credit Units : 3 units  
Credit Hours : 3 hours lecture  
Pre/Co-requisite : Eng 101

This course is divided into four parts, The Library, Expanding Students’ Vocabulary for More Effective Communication, Developing Reading Skills, and Developing Written Communication Skills. This course is to develop the students’ communicative and thinking skills which they need in academic study. Through this course students will be able to improve thinking skills, vocabulary, reading skills, comprehension and enabling skills such as taking essay examinations and using the library which will lead to a library paper.

Course Code : Fil 102  
Course Title : Pagbasa at Pagsulat sa Tungo sa Pananaliksik  
Credit Units : 3 units  
Credit Hours : 3 hours lecture  
Pre/Co-requisite : Fil 101


Course Code : Hum 102  
Course Title : Introduction to Philosophy  
Credit Units : 3 units  
Credit Hours : 3 hours lecture  
Pre/Co-requisite : Fil 101

This course covers: Philosophy: It’s Nature and Place in Society, Philosophical Fields of Study, The Nature of Man, Values and Ethics, Social and Political Philosophies,
Contemporary and Modern philosophy. Philosophy is the guide to life and everyone’s business. This course will equip the students with the relevance of philosophy, develop techniques for critical and reflective thinking to make constructive criticism, explore the nature of man, society and universe and analyze the existing stories of man’s quest for the mystery of human existence.

Course Code : Math 109  
Course Title : Solid Mensuration  
Credit Units : 3 units  
Credit Hours : 3 hours lecture  
Pre/Co-requisite : Math 104, Math 108

The study of solid mensuration is the development of space intuition, necessary in solving problems that requires thought and visualization. The knowledge of the fundamental and basic formulas in the mensuration of solid which will be developed in the course, were precisely used in many of engineering works.

Course Code : Math 110  
Course Title : Analytic Geometry  
Credit Units : 3 units  
Credit Hours : 3 hours lecture  
Pre/Co-requisite : Math 104, Math 108

Course designed for students intended to take calculus and eventually succeed in a demanding and rewarding field of engineering. Analytic Geometry is important in solving problems involving lines, conic sections, polar curves and de Moivres principle. This class will further develop the student’s mathematical and analytical skills.

Course Code : PE 102  
Course Title : Rhythmic Activities  
Credit Units : 2 units  
Credit Hours : 2 hours lecture  
Pre/Co-requisite : PE 101

It is a recreational activity by which students are taught how to express themselves through bodily movements with expression, precision, poise and grace. It deals with the fundamental and basic steps in folk dancing, ballroom dancing, modern dance, jazz and interpretative dancing.

Course Code : SS 102  
Course Title : Philippine History  
Credit Units : 3 units  
Credit Hours : 3 hours lecture  
Pre/Co-requisite : None

Ang kursong ito ay tumatalakay sa kasaysayan ng Pilipinas mula sa panahon bago ang kolonisasyon, panahon ng kolonisasyon ng mga Kastila, panahon ng imperyalismo ng mag Amerikano, panahon ng pananakop ng mga Hapon, panahon ng pagsasarili at republika.
hanging sa kasalukuyan. Sa bawat panhong nabanggit ay itinatanyag ang diwang Pilipino –
ang pag-iisip, damdamin at saloobin at maging ang mga nakaugaliang upang pagtibayin sa
mga mag-aaral ang konsepto ng pagpapakadakila ng mga Pilipino mula pa noong unang
panahon hanggang sa kasalukuyan. Nilalayon ng kursong ito na ipabatid sa mga mag-aaral
ang kalalahahan ng pagbabantog sa lahay Pilipino bilang isang dakilang lahi sa Asya. Ang
pagtalakay at pagpapahalaga sa mga ninuno at kasaysayan, at pagmamalaki sa sariling lahi.

First Year, Summer

<table>
<thead>
<tr>
<th>Course Code</th>
<th>: Math 114</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Title</td>
<td>: Differential Calculus</td>
</tr>
<tr>
<td>Credit Units</td>
<td>: 5 units</td>
</tr>
<tr>
<td>Credit Hours</td>
<td>: 5 hours lecture</td>
</tr>
<tr>
<td>Pre/Co-requisite</td>
<td>: Math 109, Math 110</td>
</tr>
</tbody>
</table>

This course deals with the basic concepts of differential calculus and their applications in
engineering-based problems. This course covers functions and limits, derivatives,
differentiation of algebraic functions and its applications, derivatives of transcendental
functions and its applications and partial derivatives. This course covers topics on functions
and limits with basic motions of the tangent line and derivatives. It also defines one-sided
limits, infinite limits, limits of infinity, continuity of a function, differentiation including
implicit differentiation, higher derivation and their applications.

Second Year, First Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>: CAD 201</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Title</td>
<td>: Computer-Aided Drafting</td>
</tr>
<tr>
<td>Credit Units</td>
<td>: 1 unit</td>
</tr>
<tr>
<td>Credit Hours</td>
<td>: 3 hours laboratory</td>
</tr>
<tr>
<td>Pre/Co-requisite</td>
<td>: Draw 101</td>
</tr>
</tbody>
</table>

Concepts of computer-aided drafting (CAD); introduction to the CAD environment;
terminologies; and the general operating procedures and techniques in entering and
executing basic CAD commands.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>: Eng 106</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Title</td>
<td>: Technical Communication</td>
</tr>
<tr>
<td>Credit Units</td>
<td>: 3 units</td>
</tr>
<tr>
<td>Credit Hours</td>
<td>: 3 hours lecture</td>
</tr>
<tr>
<td>Pre/Co-requisite</td>
<td>: Eng 102</td>
</tr>
</tbody>
</table>

This provides knowledge of the nature of Technical Communication and acknowledges the
significance of its principles in the business and engineering world. It further provides
information on the different styles and special techniques of Technical Communications. It
also intends to teach how to have introductions, transitions and conclusions; and how to
apply scientific attitude and points of view in writing and oral communications; and proper
presentation of reports, proposal, feasibility studies and researches. It likewise aims to apply the culture, scholastically through either individual or group presentation of any and all business compositions. This course covers: General Introduction to Technical Writing, Special Techniques in Technical Writing, Transitions, Introductions and Conclusions, Types of Business Letter, Types of Reports, Report Layout, The Library Research Report, The Research Skills and The Application.

Course Code : Math 115  
Course Title : Integral Calculus  
Credit Units : 5 units  
Credit Hours : 5 hours lecture  
Pre/Co-requisite : Math 114

This course gives the students knowledge about area, volume, centroid, moment of inertia, fluid pressure, work and evaluation of integral functions. Its concepts will enable the students perform the inverse process of differentiation. The knowledge that will be learned in this course is a theoretical tool that is aimed to develop the methods of integration and its application to problems in science and engineering. This course covers Integral Concept, Integration Formulas, Integration Procedures, Physical Applications of Definite Integral, and Geometric Application of Definite Integral.

Course Code : PE 103  
Course Title : Individual and Dual Sports  
Credit Units : 2 units  
Credit Hours : 2 hours lecture  
Pre/Co-requisite : PE 101

The course deals with sports which is individual and dual by nature. It consists of the background, facilities and equipment needed, skills involved, playing strategies and rules of sports.

Course Code : Phy 106  
Course Title : Physics 1  
Credit Units : 5 units  
Credit Hours : 4 hours lecture, 3 hours laboratory  
Pre/Co-requisite : Math 114, Math 115

This course is considered the science underlying all of engineering, science and technology. A thorough understanding of the fundamental concepts and principles in physics utilizing calculus based approach is essential in successful preparation of the students for the careers in science and engineering. This introductory Physics course will provide the students a broad, rigorous introduction and understanding of the basic concepts and principles of Newtonian Mechanics at the beginning college level. The course also offers the opportunity to learn what makes our real world as it is and to gain insights into the role Physics plays in our everyday lives. The course covers the Measurement and Units, Vectors, Static, Kinematics, Friction, Newton’s Laws of Motion, Work, Energy and Power, and the Elasticity.
Second Year, Second Semester

Course Code       : Comp 201
Course Title      : Computer Fundamentals and Programming
Credit Units      : 3 units
Credit Hours      : 2 hours lecture, 3 hours laboratory
Pre/Co-requisite : 2nd Year Standing

Basic information technology concepts; fundamentals of algorithm development; high-level language and programming applications; computer solutions of engineering problems.

Course Code       : PE 104
Course Title      : Team Sports
Credit Units      : 2 units
Credit Hours      : 2 hours lecture
Pre/Co-requisite : PE 101

The course deals with team sports such as volleyball, basketball, sepak takraw, softball and soccer.

Course Code       : Phy 107
Course Title      : Physics 2
Credit Units      : 5 units
Credit Hours      : 4 hours lecture, 3 hours laboratory
Pre/Co-requisite : Math 115, Phy 106

The course is a continuation of Physics 1 which covers: Fluids, Thermal Physics, Electricity, Magnetism, Waves, and Optics. This course considered the science underlying all of engineering, science, and technology using calculus-based approach. A thorough understanding of the fundamental concepts and principles in physics is essential in successful preparation of the students for the careers in science and engineering. The course is foundational and the successful completion is a prerequisite to performing well in subsequent engineering discipline courses. The course will provide the students a broad, rigorous background of physics concepts.

Course Code       : SS 104
Course Title      : Life and Works of Rizal
Credit Units      : 3 units
Credit Hours      : 3 hours lecture
Pre/Co-requisite : None

Ang kursong ito ay tumatalakay sa pag-aaral ng buhay ni Dr. Jose P. Rizal, ang ating Pambansang Bayani at Martir ng kanyang mahahalagang ginawa particular ang Noli Me Tangere at El Filibusterismo. Nilalayon ng isinabatas na kursong ito (Batas ng Republika Blg.
The introduction to chemical engineering discipline and its profession are being discussed in this course. An introduction to the basic principles in material balances associated with chemical engineering operations and processes.
This course introduces the students to a broad study on the structure and composition of materials (metals, polymers, ceramics, and composite materials) and their properties and behavior in service environments.

Course Code: Math 120  
Course Title: Differential Equations  
Credit Units: 3 units  
Credit Hours: 3 hours lecture  
Pre/Co-requisite: Phy 107

Differentiation and integration in solving first order, first-degree differential equations, and linear differential equations of order $n$; Laplace transforms in solving differential equations.

Course Code: ChE 304  
Course Title: Chemical Engineering Materials  
Credit Units: 3 units  
Credit Hours: 3 hours lecture  
Pre/Co-requisite: Chem 103

This course introduces the students to a broad study on the structure and composition of materials (metals, polymers, ceramics, and composite materials) and their properties and behavior in service environments.

Course Code: Math 120  
Course Title: Differential Equations  
Credit Units: 3 units  
Credit Hours: 3 hours lecture  
Pre/Co-requisite: Phy 107

Differentiation and integration in solving first order, first-degree differential equations, and linear differential equations of order $n$; Laplace transforms in solving differential equations.

Course Code: ChE 302  
Course Title: Basic Organic Chemistry  
Credit Units: 3 units  
Credit Hours: 2 hours lecture, 3 hours laboratory  
Pre/Co-requisite: Chem 103

This course deals with the study of chemistry of carbon compounds and their properties, structures and reactions of carbon containing compounds. It emphasizes the study of the principal classes of aliphatic and aromatic compounds, which in conjunction with selected experiments, gives an understanding of the mechanisms of organic reactions. The laboratory portion of the course will introduce the student to a variety of techniques for the synthesis, purification, and analysis of organic compounds. This is a laboratory course covering the synthesis and properties of organic compounds, semi-micro and macro-techniques, and quantitative organic analysis.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Units</th>
<th>Credit Hours</th>
<th>Pre/Co-requisite</th>
</tr>
</thead>
<tbody>
<tr>
<td>ChE 303</td>
<td>Qualitative/Quantitative Chemistry</td>
<td>3 units</td>
<td>2 hours lecture, 3 hours laboratory</td>
<td>Chem 103</td>
</tr>
</tbody>
</table>

This course is a study of the theory and practice of gravimetric and volumetric methods of analysis, including an introduction to instrumental methods of analysis. This laboratory course applies the principles and theories of gravimetric and volumetric methods of analysis of chemical samples, with emphasis on laboratory techniques and accuracy of measurements.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Units</th>
<th>Credit Hours</th>
<th>Pre/Co-requisite</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 330</td>
<td>Thermodynamics</td>
<td>3 units</td>
<td>3 hours lecture</td>
<td>Phy 107</td>
</tr>
</tbody>
</table>

This course deals with the applications of the 1st and 2nd laws of thermodynamics to close and open systems, volumetric properties of pure substances, the use of phase diagrams and thermodynamic tables, applications of equations of state for ideal and non-ideal fluids.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Units</th>
<th>Credit Hours</th>
<th>Pre/Co-requisite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech 301</td>
<td>Statics of Rigid Bodies</td>
<td>3 units</td>
<td>3 hours lecture</td>
<td>Phy 107</td>
</tr>
</tbody>
</table>

Force systems; structure analyses; friction; centroids and centers of gravity; and moments of inertia are discussed in this course.

**Third Year, Second Semester**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Units</th>
<th>Credit Hours</th>
<th>Pre/Co-requisite</th>
</tr>
</thead>
<tbody>
<tr>
<td>FE 303</td>
<td>General Microbiology</td>
<td>4 units</td>
<td>3 hours lecture, 3 hours laboratory</td>
<td>FE 301</td>
</tr>
</tbody>
</table>

The course is an integral part of many different scientific studies, such as immunology, genetics, molecular biology, biochemistry, medicine, agriculture, ecology, industrial processes and many more.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Units</th>
<th>Credit Hours</th>
<th>Pre/Co-requisite</th>
</tr>
</thead>
<tbody>
<tr>
<td>FE 304</td>
<td>Food Chemistry</td>
<td>5 units</td>
<td>3 hours lecture, 6 hours laboratory</td>
<td>ChE 333</td>
</tr>
</tbody>
</table>
The course applies basic scientific principles to food systems and practical applications. Chemical/biochemical reactions of carbohydrates, lipids, proteins, and other constituents in fresh and processed foods are discussed with respect to food quality. Reaction conditions and processes that affect color, flavor, texture, nutrition, and safety of food are emphasized.

Course Code : FE 303
Course Title : Food Packaging and Labeling
Credit Units : 3 units
Credit Hours : 3 hours lecture
Pre/Co-requisite : FE 302

This course shows principles and methods of food packaging and labeling; and evaluation of properties of packaging and labeling materials.

Course Code : FE 306
Course Title : Advanced Engineering Mathematics for Food Engineering
Credit Units : 3 units
Credit Hours : 3 hours lecture
Pre/Co-requisite : Math 120

This course is a continuation of Differential Equations and is a combination of selected analytical and numerical methods of solutions to problems commonly encountered in chemical engineering. Laplace Transforms and Fourier Series are discussed as a tool in solving ordinary and partial differential equations analytically. Numerical Methods are applied in determining roots of non-linear equations, integration, differentiation and solutions of ordinary and partial differential equations. Knowledge of computer programming or the use of commercial software is essential to facilitate repetitive numerical calculations.

Course Code : ChE 335
Course Title : Physical Chemistry
Credit Units : 3 units
Credit Hours : 2 hours lecture, 3 hours laboratory
Pre/Co-requisite : ChE 334

This course deals with the study of the physical properties and structure of matter, which laws of chemical reaction, and with the theories governing these. This laboratory course covers the experiments concerning fundamental physical properties such as density, viscosity, melting point, surface tension; determination of optical properties by applying the principles of colorimetry/turbidimetry, spectrophotometry, refractometry and polarimetry. This course will also deal with important colligative properties, namely boiling point elevation and freezing point depression.

Course Code : Mech 302
Course Title : Dynamics of Rigid Bodies
Credit Units : 2 units
Credit Hours : 2 hours lecture
Pre/Co-requisite : Mech 301
Kinetics and kinematics of a particle; kinetics and kinematics of rigid bodies; work energy method; and impulse and momentum are discussed in this course.

Course Code : Mech 303  
Course Title : Mechanics of Deformable Bodies  
Credit Units : 3 units  
Credit Hours : 3 hours lecture  
Pre/Co-requisite : Mech 301

Axial stress and strain; stresses for torsion and bending; combined stresses; beam deflections; indeterminate beams; and elastic instability are discussed in this course.

**Third Year, Summer**

Course Code : FE 307  
Course Title : Field Trips and Seminars for FE  
Credit Units : 1 unit  
Credit Hours : 3 hours laboratory  
Pre/Co-requisite : 3rd Year Standing

This course deals with a series of lectures and seminars on selected topics that are highly relevant to food engineering but are not covered in any of the other formal courses. It covers recent advances in food engineering. Visits to industrial plants are also conducted during the term.

Course Code : FE 308  
Course Title : Food Process Industries  
Credit Units : 3 units  
Credit Hours : 3 hours lecture  
Pre/Co-requisite : 3rd Year Standing

This course serves as an introduction to the practice of food engineering. Specifically, it deals with the unit processes and operations involved in selected food industries.

Course Code : IE 307  
Course Title : Engineering Economy  
Credit Units : 3 units  
Credit Hours : 3 hours lecture  
Pre/Co-requisite : 3rd Year Standing

Concepts of the time value of money and equivalence; basic economy study methods; decisions under certainty; decisions recognizing risk; and decisions admitting uncertainty are discussed in this course.
Fourth Year, First Semester

Course Code : FE 409  
Course Title : Food Microbiology  
Credit Units : 4 units  
Credit Hours : 2 hours lecture, 6 hours laboratory  
Pre/Co-requisite : FE 303

This course shows the microbial flora of food as affected by processing. Preservation techniques with special attention to beneficial groups of microorganisms, pathogenic, and spoilage microorganisms.

Course Code : FE 410  
Course Title : Technical Analysis of Food and Feeds  
Credit Units : 4 units  
Credit Hours : 3 hours lecture, 3 hours laboratory  
Pre/Co-requisite : ChE 334, FE 304

This course covers the theory and practice of selected analytical methods applicable to foods and feeds including instrumentation. Basic principles of each procedure is presented for better understanding and will serve as a guide in the selection of the appropriate method for specific samples. Knowledge of the basic principles and or the chemical reactions involved in the procedure will help in the assessment of the interferences and applicability of the method.

Course Code : FE 411  
Course Title : Fluid flow in Food Processing  
Credit Units : 4 units  
Credit Hours : 3 hours lecture, 3 hours laboratory  
Pre/Co-requisite : Math 120

This course deals with the compressible or incompressible fluid flow, branching of fluids in transport, steady or unsteady flow, including metering of fluids that are important in the design of fluid flow piping network. The course ends with the design of different types of filtration equipment operated at constant pressure; constant rate or a combined constant pressure proceeded by constant rate.

Course Code : FE 412  
Course Title : Methods of Research for FE  
Credit Units : 3 units  
Credit Hours : 3 hours lecture  
Pre/Co-requisite : 4th Year Standing, Eng 106

This course deals with research preparation methods, research tools, research proposals, and the implementation, presentation and publication of research work. Students proposed research topics in this course in preparation for FE Project 1.
**Course Code**: EE 427  
**Course Title**: Basic Electrical and Electronics Engineering  
**Credit Units**: 3 units  
**Credit Hours**: 2 hours lecture, 3 hours laboratory  
**Pre/Co-requisite**: Phy 107

This course deals with the basic principles of electrical and electronics engineering of relevance to food engineers.

**Course Code**: EnE 301  
**Course Title**: Environmental Engineering  
**Credit Units**: 2 units  
**Credit Hours**: 2 hours lecture  
**Pre/Co-requisite**: Chem 103

Ecological framework of sustainable development; pollution environments: water, air, and solid; waste treatment processes, disposal, and management; government legislation, rules, and regulation related to the environment and waste management; and environmental management system.

**Course Code**: Math 121  
**Course Title**: Probability and Statistics  
**Credit Units**: 3 units  
**Credit Hours**: 3 hours lecture  
**Pre/Co-requisite**: FE 306

Basic principles of statistics; averages, median, mode; deviations; probability distributions; normal curves and applications; regression analysis and correlation; presentation and analysis of data; application to engineering problems and experimental evaluation of results.

**Fourth Year, Second Semester**

**Course Code**: FE 413  
**Course Title**: Biochemistry  
**Credit Units**: 3 units  
**Credit Hours**: 3 hours lecture  
**Pre/Co-requisite**: FE 301

This subject opens with an overview of basic microbiology which includes the types of cells and their physical and chemical structure. Since enzymes are essential to biological life their role and the factors that affect their activity is discussed. Also included is a discussion of how enzymes can be produced for industrial application. The second part of this subject is a discussion of the mechanism by which cells grow and work in batch and continuous processes and how environmental factors affect their metabolic activity. This subject is concluded by considering how cells can be altered so that their metabolic capability may be enhanced.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>FE 414</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Title</td>
<td>Sensory Evaluation and Product Development</td>
</tr>
<tr>
<td>Credit Units</td>
<td>3 units</td>
</tr>
<tr>
<td>Credit Hours</td>
<td>2 hours lecture, 3 hours laboratory</td>
</tr>
<tr>
<td>Pre/Co-requisite</td>
<td>FE 304, Math 121</td>
</tr>
</tbody>
</table>

This course is designed as an introduction to the functional properties of food components and added ingredients, to the principles of product design and development. It also includes the principles and techniques in sensory evaluation and statistical analysis and interpretation of sensory evaluation data in their relation to physics and chemistry.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>FE 415</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Title</td>
<td>Heat Transfer in Foods</td>
</tr>
<tr>
<td>Credit Units</td>
<td>4 units</td>
</tr>
<tr>
<td>Credit Hours</td>
<td>3 hours lecture, 3 hours laboratory</td>
</tr>
<tr>
<td>Pre/Co-requisite</td>
<td>FE 411</td>
</tr>
</tbody>
</table>

The course deals with the different modes of heat transfer; laws governing conduction, convection and radiation and its application to the design of common heat exchangers such as condenser. Cooling coils and evaporators; and the environmental impact of their operation.

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<thead>
<tr>
<th>Course Code</th>
<th>FE 416</th>
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<tbody>
<tr>
<td>Course Title</td>
<td>Plant Design I</td>
</tr>
<tr>
<td>Credit Units</td>
<td>3 units</td>
</tr>
<tr>
<td>Credit Hours</td>
<td>3 hours lecture</td>
</tr>
<tr>
<td>Pre/Co-requisite</td>
<td>FE 306, Mech 303</td>
</tr>
</tbody>
</table>

This is the capstone FE course which utilizes the basic technical principles of food engineering (material balances, energy balances, transport phenomena, thermodynamics, kinetics, separations and unit operations) with practical elements of economics, along with principles of safety and environmental issues in the optimum design of an integrated food process plant.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>FE 418</th>
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<tbody>
<tr>
<td>Course Title</td>
<td>Science and Technology of Animal and Fish Products</td>
</tr>
<tr>
<td>Credit Units</td>
<td>3 units</td>
</tr>
<tr>
<td>Credit Hours</td>
<td>2 hours lecture, 3 hours laboratory</td>
</tr>
<tr>
<td>Pre/Co-requisite</td>
<td>FE 409, FE 410</td>
</tr>
</tbody>
</table>

This course covers the anatomy and physiology of animals and fish (specifically those that are abundant in the Philippines), nutritional importance, and its characteristics such as a food. Emphasis will be on meat and fish preservation (drying, curing, salting, smoking and fermenting) and processing (canning, chilling, thawing and modified atmosphere packaging).
Credit Hours : 2 hours lecture
Pre/Co-requisite : 4th Year Standing

The course offers discussion on the relevant national laws on the professional practice in the Philippines, food engineering profession, contracting, project implementation, environment and safety, investments and setting of enterprises in the Philippines. It also covers discussion on ethical standards for food engineers.

Fifth Year, First Semester

Course Code : FE 520
Course Title : Plant Design 2
Credit Units : 3 units
Credit Hours : 3 hours lecture
Pre/Co-requisite : FE 416

The students execute the proposal design presented in the course Plant Design 1.

Course Code : FE 521
Course Title : Science and Technology of Plant Products
Credit Units : 3 units
Credit Hours : 2 hours lecture, 3 hours laboratory
Pre/Co-requisite : FE 409, FE 410

This course shows the basic principles underlying crop growth and development in relation to the external factors of the environment and the appropriate crop production practices and management to follow for both agronomic and horticultural crops. The objectives of production are to increase its efficiency and enhance the quality of the products. It also covers the different principles regarding the processing of basic products.

Course Code : FE 522
Course Title : Food Safety, Sanitation, and Quality Assurance
Credit Units : 3 units
Credit Hours : 3 hours lecture
Pre/Co-requisite : FE 409

This course shows the essentials food safety. This seek to identify food safety issues as related to preparation, handling, processing, and distribution of food and explain and discuss the concepts and methods used to control and maintain the quality and safety of foods.

Course Code : FE 523
Course Title : Food Engineering Project 2
Credit Units : 1 unit
Credit Hours : 3 hours laboratory
Pre/Co-requisite : FE 417
The students execute the methodology presented in the course Methods of Research through the conduct of experiments or prototype development expecting partial results of the experiments or designs made.

Course Code : FE 524  
Course Title : Material Handling and Separation Process  
Credit Units : 3 units  
Credit Hours : 3 hours lecture  
Pre/Co-requisite : EnE 301

This course covers the application of principles to equilibrium stage separation operations such as distillation, liquid-liquid extraction, solid-liquid extraction, adsorption, gas absorption and membrane separation. This course is also intended to provide background material in particle technology, focusing on characterization, behavior, production, separation, and modeling of particulate systems and surveying engineering processes that involve particulates and powders. Multiphase transport phenomena and fluidization are also discussed. A laboratory course to investigate various theories encountered in momentum transfer, heat transfer and evaporation. This will also serve as a venue for the discussion of solids handling and separation.

Course Code : IE 530  
Course Title : Engineering Management  
Credit Units : 3 units  
Credit Hours : 3 hours lecture  
Pre/Co-requisite : 5th Year Standing, IE 307

Decision-making; the functions of management; managing production and service operations; managing the marketing function; and managing the finance function.

Course Code : IE 532  
Course Title : Technopreneurship  
Credit Units : 3 units  
Credit Hours : 3 hours lecture  
Pre/Co-requisite : 5th Year Standing, IE 307

A course is designed to guide students through the business and legal fundamentals of starting and running a business in the new economy marketing technologies developed.

**Fifth Year, Second Semester**

Course Code : OJT 500  
Course Title : Internship Training  
Credit Units : 10 units  
Credit Hours : 0 hour lecture or laboratory  
Pre/Co-requisite : Regular Standing

The students are trained in the real food manufacturing plants to prepare them in the Food Engineering profession.