



## Degree and Study Plan

College: Agricultural & Marine Sciences  
Department: Soils, Water and Agricultural Engineering  
Cohorts: 2016  
Degree: Bachelor of Science  
Major: Water Technology

### Summary of Credits:

|                                                |            |
|------------------------------------------------|------------|
| <b>University Requirements (UR)</b>            | <b>6</b>   |
| Arabic                                         | 3          |
| Contemporary Omani Society                     | 1          |
| Oman & Islamic Civilization or Islamic Culture | 2          |
| <b>University Electives (UE)</b>               | <b>6</b>   |
| See List A                                     |            |
| <b>College Requirements (CR)</b>               | <b>29</b>  |
| See list B                                     |            |
| <b>College Electives (CE)</b>                  | <b>9</b>   |
| See list C                                     |            |
| <b>Departmental Requirements (DR)</b>          |            |
| See list D                                     |            |
| <b>Departmental Electives</b>                  |            |
| See list E                                     |            |
| <b>Major Requirements (AR)</b>                 | <b>55</b>  |
| See list F                                     |            |
| <b>Major Electives (AE)</b>                    | <b>21</b>  |
| See list G                                     |            |
| <b>Specialization Requirements (SR)</b>        |            |
| See list H                                     |            |
| <b>Specialization Electives (SE)</b>           |            |
| See list I                                     |            |
| <b>Minor Requirements (IR)</b>                 | <b>3</b>   |
| See list J                                     |            |
| <b>Minor Electives (IE)</b>                    | <b>15</b>  |
| See list K                                     |            |
| <b>TOTAL</b>                                   | <b>126</b> |

For reference contact: **Dr. Hemanatha Jayasuriya** Ext. 1223

HoD: **Dr. Hemanatha Jayasuriya**  
Dean's Office: **Dr. Rashid Al Yahyai**  
Admission and Registration:

Date:  
Date:  
Date:

# DEPARTMENT OF SOIL, WATER AND AGRICULTURAL ENGINEERING

## WATER TECHNOLOGY

### Study Plan: for Cohort 2016

| Sem.     | Course Code  | Course Title       | Cr.      | Pre-req./Co-req.* | Cat. |
|----------|--------------|--------------------|----------|-------------------|------|
| ONE FALL |              | Foundation Program | 0        |                   | UR   |
|          | <b>TOTAL</b> |                    | <b>0</b> |                   |      |

|            |              |                                        |           |                                                                        |    |
|------------|--------------|----------------------------------------|-----------|------------------------------------------------------------------------|----|
| TWO SPRING | ARAB1001     | Arabic                                 | 3         |                                                                        | UR |
|            | CAMS2000     | Intro. CAMS                            | 0         |                                                                        | CR |
|            | CAMS2003     | Intro. to Food & Resource Economics    | 3         | FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604)                     | CR |
|            | CHEM2101     | General Chemistry I                    | 4         | FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604), FPMT(0105 or 0109) | CR |
|            | LANC2145     | Communication in Agricultural Sciences | 3         | FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604)                     | CR |
|            |              | University Elective                    | 2         |                                                                        | UE |
|            | <b>TOTAL</b> |                                        | <b>15</b> |                                                                        |    |

|            |              |                             |           |                                                                        |    |
|------------|--------------|-----------------------------|-----------|------------------------------------------------------------------------|----|
| THREE FALL | HIST1010     | Oman & Islamic Civilization | 2         | =ISLM1010                                                              | UR |
|            | LANC2146     | Academic Writing in Science | 3         | LANC(2145 or 2142)                                                     | CR |
|            | PHYS2101     | General Physics I           | 4         | FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604), FPMT(0105 or 0109) | CR |
|            |              | University Elective         | 2         |                                                                        | UE |
|            |              | University Elective         | 2         |                                                                        | UE |
|            |              | College Elective            | 3         | FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604)                     | CE |
|            | <b>TOTAL</b> |                             | <b>16</b> |                                                                        |    |

|             |              |                                       |           |                                                    |    |
|-------------|--------------|---------------------------------------|-----------|----------------------------------------------------|----|
| FOUR SPRING | SOCY1001     | Contemporary Omani Society            | 1         | = SOCI3320                                         | UR |
|             | BIOL2101     | General Biology I                     | 4         | FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604) | CR |
|             | CAMS3000     | Seminar & Presentation Skills         | 2         | CAMS2000, FPMT(0105 or 0109), LANC2146             | CR |
|             | CAMS3001     | Biometry & Experimental Design in AMS | 3         | CAMS2000, FPMT(0105 or 0109), LANC2146             | CR |
|             |              | College Elective                      | 3         | FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604) | CE |
|             |              | College Elective                      | 3         | FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604) | CE |
|             | <b>TOTAL</b> |                                       | <b>16</b> |                                                    |    |

|           |              |                                   |           |                                                                        |    |
|-----------|--------------|-----------------------------------|-----------|------------------------------------------------------------------------|----|
| FIVE FALL | MATH2107     | Calculus I                        | 4         | FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604), FPMT(0105 or 0109) | AR |
|           | SWAE3303     | Elements of Hydrology             | 3         | PHYS2101, SWAE(2001 or 2201)                                           | AR |
|           | SWAE3308     | Instrumentation & Control Systems | 3         | MATH2107, PHYS2101                                                     | AR |
|           | SWAE3310     | Fundamentals of Fluid Mechanics   | 3         | MATH2107, PHYS(2101 or 2107)                                           | AR |
|           | SWAEXXX      | Major Elective                    | 3         | Check pre-requisites                                                   | AE |
|           | <b>TOTAL</b> |                                   | <b>16</b> |                                                                        |    |

|               |          |                            |           |                                   |    |
|---------------|----------|----------------------------|-----------|-----------------------------------|----|
| SIX<br>SPRING | SWAE3001 | GIS for Environmentalists  | 3         | LANC 2146 or 2041 or 2052 or 2058 | AR |
|               | SWAE3304 | Soil & Water Conservation  | 3         | PHYS2101 , SWAE(2001 or 2201)     | AR |
|               | SWAE3305 | Agro-climatology           | 3         | PHYS2101                          | AR |
|               | SWAE3315 | Water Quality              | 3         | CHEM2101, SWAE2201                | AR |
|               | SWAE3311 | Environmental Soil Physics | 3         | PHYS2101 , SWAE2201               | AR |
| <b>TOTAL</b>  |          |                            | <b>15</b> |                                   |    |

|               |          |                       |           |                                |    |
|---------------|----------|-----------------------|-----------|--------------------------------|----|
| SEVEN<br>FALL | SWAE3005 | Land Surveying        | 3         | MATH2107 and PHYS2101          | AR |
|               | SWAE3402 | Irrigation Principles | 3         | SWAE2201                       | AR |
|               | SWAE4325 | Water Treatment       | 3         | CHEM2101, MATH2107, SWAE3315 + | AR |
|               | SWAEXXXX | Major Elective        | 3         | Check pre-requisites           | AE |
|               | SWAEXXXX | Major Elective        | 3         | Check pre-requisites           | AE |
| <b>TOTAL</b>  |          |                       | <b>15</b> |                                |    |

|                 |          |                                        |           |                        |    |
|-----------------|----------|----------------------------------------|-----------|------------------------|----|
| EIGHT<br>SPRING | SWAE4217 | Transport of Chemicals in Porous Media | 3         | SWAE(3303, 3311) + CR* | AR |
|                 | SWAE4305 | Water Control & Supply                 | 3         | SWAE(2201, 3310) + CR* | AR |
|                 | SWAE4400 | Ground Water Hydrology                 | 3         | SWAE3303 + CR*         | AR |
|                 | SWAE4402 | Design & Manage. Irrigation Systems    | 3         | SWAE(3310, 3402) + CR* | AR |
|                 | SWAEXXXX | Major Elective                         | 3         | Check pre-requisites   | AE |
| <b>TOTAL</b>    |          |                                        | <b>15</b> |                        |    |

|        |              |                 |          |                         |    |
|--------|--------------|-----------------|----------|-------------------------|----|
| SUMMER | SWAE4800     | SWAE Internship | 3        | After 90 Credits, + CR* | AR |
|        | <b>TOTAL</b> |                 | <b>3</b> |                         |    |

|              |          |                                 |           |                          |    |
|--------------|----------|---------------------------------|-----------|--------------------------|----|
| NINE<br>FALL | CAMS4001 | Management and Business Skills  | 3         | CR*                      | CR |
|              | SWAE4415 | Water Res. Management & Legist. | 3         | MATH2107, SWAE3303 + CR* | AR |
|              | SWAEXXXX | Major Elective                  | 3         | Check pre-requisites     | AE |
|              | SWAEXXXX | Major Elective                  | 3         | Check pre-requisites     | AE |
|              | SWAEXXXX | Major Elective                  | 3         | Check pre-requisites     | AE |
| <b>TOTAL</b> |          |                                 | <b>15</b> |                          |    |

\* CR - CAMS college requirements which are BIOL2101, CAMS2000, CAMS2003, CAMS3000, CAMS3001, CHEM2101, PHYS2101 or PHYS2107.

**DEPARTMENT OF SOIL, WATER AND AGRICULTURAL ENGINEERING****WATER TECHNOLOGY****LIST B: College Requirements (29 Credits)**

| Course Code | Course Title                                     | Cr. | Pre-Requisite                                                          | Equivalents |
|-------------|--------------------------------------------------|-----|------------------------------------------------------------------------|-------------|
| BIOL2101    | General Biology I                                | 4   | FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604)                     |             |
| CAMS2000    | Introduction to Agricultural and Marine Sciences | 0   |                                                                        |             |
| CAMS2003    | Introduction to Food and Resource Economics      | 3   | FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604)                     |             |
| CAMS3000    | Seminar and Presentation Skills                  | 2   | CAMS2000, (FPMT0105 or FPMT0109), LANC2146                             |             |
| CAMS3001    | Biometry and Experimental Design in AMS          | 3   | CAMS2000, (FPMT0105 or FPMT0109), LANC2146                             |             |
| CAMS4001    | Management and Business Skills                   | 3   | CR*                                                                    |             |
| CHEM2101    | General Chemistry I                              | 4   | FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604), FPMT(0105 or 0109) |             |
| LANC2145    | Communication in Agricultural Sciences           | 3   | FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604)                     |             |
| LANC2146    | Academic Writing in Science                      | 3   | LANC 2145 or LANC2142                                                  |             |
| PHYS2101    | General Physics I                                | 4   | FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604), FPMT(0105 or 0109) |             |

**LIST C: College Electives (9 Credits)**

| Course Code | Course Title                                  | Cr. | Pre-Requisite                                      | Equivalents |
|-------------|-----------------------------------------------|-----|----------------------------------------------------|-------------|
| ANVS2001    | Principles of Animal Science                  | 3   | FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604) |             |
| ANVS2002    | Introduction to Veterinary Technology         | 3   |                                                    |             |
| CROP2510    | Introduction to Crop Production               | 3   |                                                    |             |
| FSHN2071    | Principles of Food Science                    | 3   |                                                    |             |
| FSHN2301    | Introduction to Human Nutrition and Dietetics | 3   |                                                    |             |
| MASF2003    | Introduction to Marine Science and Fisheries  | 3   |                                                    |             |
| SWAE2001    | Introduction to Agricultural Engineering      | 3   |                                                    |             |
| SWAE2201    | Introduction to Soils and Water               | 3   |                                                    |             |

\* CR - CAMS college requirements which are BIOL2101, CAMS2000, CAMS2003, CAMS3000, CAMS3001, CHEM2101, PHYS2101 or PHYS2107.

# DEPARTMENT OF SOIL, WATER AND AGRICULTURAL ENGINEERING

## WATER TECHNOLOGY

### LIST F: Major Requirements (55 Credits)

| Course Code | Course Title                              | Cr. | Pre-Requisite                                                          | Equivalents |
|-------------|-------------------------------------------|-----|------------------------------------------------------------------------|-------------|
| MATH2107    | Calculus I                                | 4   | FPPL(0560 or 0600 or 0601 or 0602 or 0603 or 0604), FPMT(0105 or 0109) |             |
| SWAE3001    | GIS for Environmentalists                 | 3   | LANC 2146 or 2041 or 2052 or 2058                                      |             |
| SWAE3005    | Land Surveying                            | 3   | MATH2107, PHYS2101                                                     |             |
| SWAE3303    | Elements of Hydrology                     | 3   | PHYS2101, SWAE2201                                                     |             |
| SWAE3304    | Soil & Water Conservation                 | 3   | PHYS2101, SWAE(2001 or 2201)                                           |             |
| SWAE3305    | Agro-climatology                          | 3   | PHYS2101                                                               |             |
| SWAE3308    | Instrumentation & Control Systems         | 3   | MATH2107, PHYS2101                                                     |             |
| SWAE3310    | Fundamentals of Fluid Mechanics           | 3   | MATH2107, PHYS(2101 or 2107)                                           |             |
| SWAE3311    | Environmental Soil Physics                | 3   | PHYS2101, SWAE2201                                                     |             |
| SWAE3315    | Water Quality                             | 3   | PHYS2101, SWAE2201                                                     |             |
| SWAE3402    | Irrigation Principles                     | 3   | SWAE2201                                                               |             |
| SWAE4217    | Transport of Chemicals in Porous Media    | 3   | SWAE(3303, 3311) + CR*                                                 |             |
| SWAE4305    | Water Control and Supply                  | 3   | SWAE(2201, 3310) + CR*                                                 |             |
| SWAE4325    | Water Treatment                           | 3   | CHEM2101, MATH2107, SWAE3315 + CR*                                     |             |
| SWAE4400    | Ground Water Hydrology                    | 3   | SWAE3303 + CR*                                                         |             |
| SWAE4402    | Design & Management of Irrigation Systems | 3   | SWAE(3310, 3402) + CR*                                                 |             |
| SWAE4415    | Water Resources Management & Legislation  | 3   | MATH2107, SWAE3303 + CR*                                               |             |
| SWAE4800    | SWAE Internship                           | 3   | After 90 Credits + CR*                                                 |             |

### LIST G: Major Electives (21 Credits)\*\*

| Course Code | Course Title                                                | Cr. | Pre-Requisite                                      | Equivalents |
|-------------|-------------------------------------------------------------|-----|----------------------------------------------------|-------------|
| CHPE4302    | Desalination                                                | 3   | MEIE3141                                           |             |
| ERSC2101    | Introduction to Geology                                     | 4   | FPPL(0560 or 0600 or 0601 or 0602 or 0603 or 0604) |             |
| ERSC4031    | Geochemistry                                                | 3   | CHEM2101, CHEM2201, ERSC2102                       |             |
| ERSC4041    | Introduction to Geophysics                                  | 3   | ERSC2101, PETR3246, PHYS2101                       |             |
| MEIE3141    | Thermodynamics                                              | 3   | CHEM2101, MATH2107, PHYS(2101 or 2107)             |             |
| SWAE3002    | Desertification & Land Restoration                          | 3   | SWAE2201                                           |             |
| SWAE3306    | Computer Programming                                        | 3   | MATH2107, PHYS(2101 or 2107)                       |             |
| SWAE4006    | Arid-zone Hydrology                                         | 3   | SWAE3303 + CR*                                     |             |
| SWAE4111    | Hydrogeology for Soil-Water-Landscape Interactions          | 3   | SWAE(2201, 3303, 3311) + CR*                       |             |
| SWAE4304    | Modeling & Analysis of Biophysical Systems                  | 3   | PHYS2101 + CR*                                     |             |
| SWAE4401    | Water & Nutrients in Soil-Plant Environments                | 3   | SWAE2201 + CR*                                     |             |
| SWAE4412    | Management of Salt-Affected Soils                           | 3   | SWAE2201 + CR*                                     |             |
| SWAE4902    | Research Project in Soils, Water & Agricultural Engineering | 3   | Manual Registration, GPA≥2.5 + CR*                 |             |

\* CR - CAMS college requirements which are BIOL2101, CAMS2000, CAMS2003, CAMS3000, CAMS3001, CHEM2101, PHYS2101 or PHYS2107.

\*\* Courses from any Department (preferably related to a Minor) of the College of Agricultural and Marine Sciences or another College, may be selected with the approval of Academic Advisor, Head of Department and Assistant Dean of Undergraduate Studies. **No course will be approved without filling the substitution form and getting all necessary approvals prior registering any course not listed in the above degree plan.**

**DEPARTMENT OF SOIL, WATER AND AGRICULTURAL ENGINEERING****WATER TECHNOLOGY****LIST J: Minor Requirements (3 Credits)**

| Course Code | Course Title                   | Cr. | Pre-Requisite                                      |
|-------------|--------------------------------|-----|----------------------------------------------------|
| SWAE2201    | Introduction to Soil and Water | 3   | FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604) |

**LIST K: Minor Electives (15 Credits)**

| Course Code | Course Title                              | Cr. | Pre-Requisite                          |
|-------------|-------------------------------------------|-----|----------------------------------------|
| SWAE3303    | Elements of Hydrology                     | 3   | PHYS(2101 or 2107), SWAE(2201 or 2001) |
| SWAE3310    | Fundamentals of Fluid Mechanics           | 3   | MATH2107, PHYS(2101 or 2107)           |
| SWAE3315    | Water Quality                             | 3   | CHEM2101, SWAE2201                     |
| SWAE3402    | Irrigation Principles                     | 3   | SWAE2201                               |
| SWAE4217    | Transport of Chemicals in Porous Media    | 3   | SWAE(3303, 3311) + CR                  |
| SWAE4305    | Water Control and Supply                  | 3   | SWAE(2201, 3310)+ CR*                  |
| SWAE4325    | Water Treatment                           | 3   | CHEM2101, MATH2107, SWAE3315 + CR*     |
| SWAE4400    | Ground Water Hydrology                    | 3   | SWAE3303 + CR*                         |
| SWAE4402    | Design & Management of Irrigation Systems | 3   | SWAE(3310, 3402) + CR*                 |

## LIST J: MINOR REQUIREMENTS

### Within CAMS (18 credits):

#### J1. Minor in Animal Science (18 credits)

| Course Code                            | Course Title                   | Cr. | Pre-Requisite                                      |
|----------------------------------------|--------------------------------|-----|----------------------------------------------------|
| ANVS2101                               | Introduction to Animal Science | 3   | FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604) |
| <b>Five courses from the following</b> |                                |     |                                                    |
| ANVS3208                               | Veterinary Immunology          | 3   | ANVS(2101 or 2201), BIOL2101                       |
| ANVS3101                               | Genetics and Animal Breeding   | 3   | ANVS(2101 or 2201), BIOL2101                       |
| ANVS3102                               | Animal Health                  | 3   | ANVS2101, BIOL2101                                 |
| ANVS3104                               | Anatomy and Histology          | 3   | ANVS(2101 or 2201), BIOL2101                       |
| ANVS3105                               | Fundamentals of Nutrition      | 3   | (ANVS(2101 or 2201), BIOL2101                      |
| ANVS3106                               | Systemic Physiology            | 3   | ANVS(2101 or 2201), BIOL2101                       |
| ANVS3107                               | Animal Reproductive Physiology | 3   | ANVS(2101 or 2201), BIOL2101                       |
| ANVS4101                               | Dairy and Beef Production      | 3   | ANVS(2101 or 2201) + CR*                           |
| ANVS4102                               | Poultry Production             | 3   | ANVS(2101 or 2201) + CR*                           |
| ANVS4104                               | Camel Physiology and Husbandry | 3   | ANVS(2101 or 2201) + CR*                           |
| ANVS4106                               | Sheep and Goat Production      | 3   | ANVS(2101 or 2201) + CR*                           |
| ANVS4107                               | Animal Nutrition               | 3   | ANVS3105 + CR*                                     |
| ANVS4108                               | Meat Science                   | 3   | ANVS(2101 or 2201) + CR*                           |
| ANVS4111                               | Horse Management and Care      | 3   | ANVS(2101 or 2201) + CR*                           |

#### J2. Minor in Crop Sciences (18 credits)

| Course Code                            | Course Title                  | Cr. | Pre-Requisite                                      |
|----------------------------------------|-------------------------------|-----|----------------------------------------------------|
| CROP2510                               | Introduction to Crop Sciences | 3   | FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604) |
| <b>Five courses from the following</b> |                               |     |                                                    |
| CROP2011                               | Ornamental Horticulture       | 3   | BIOL2101                                           |
| CROP3502                               | Forages and Pastures          | 3   | BIOL2101                                           |
| CROP3512                               | Vegetable Production          | 3   | CROP2510                                           |
| CROP3514                               | Fruit Production              | 3   | CROP2510                                           |
| CROP3522                               | Plant Pathology               | 3   | BIOL2101                                           |
| CROP3526                               | General Entomology            | 3   | BIOL2101                                           |
| CROP4005                               | Field Crop Production         | 3   | CROP2510 + CR*                                     |
| CROP4514                               | Landscape Plant Management    | 3   | CROP(2011, 2510) + CR*                             |

#### J3. Minor in Food Science (18 credits)

| Course Code                            | Course Title                                | Cr. | Pre-Requisite                                      |
|----------------------------------------|---------------------------------------------|-----|----------------------------------------------------|
| FSHN2101                               | Principles of Food Science                  | 3   | FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604) |
| <b>Five courses from the following</b> |                                             |     |                                                    |
| FSHN3101                               | Properties of Food & Agricultural Materials | 3   | (FSHN2101 or SWAE2001), PHYS(2101 or 2107)         |
| FSHN3103                               | Food Analysis                               | 3   | CHEM3323, FSHN2302                                 |
| FSHN3104                               | Food Chemistry I                            | 3   | CHEM3323, FSHN2302                                 |
| FSHN3105                               | Food Microbiology I                         | 3   | BIOL3441                                           |
| FSHN3106                               | Food Processing I                           | 3   | FSHN2101 or SWAE2001                               |
| FSHN3107                               | Food Sanitation and Quality Control         | 3   | BIOL3441, FSHN2101                                 |
| FSHN3108                               | Food Packaging                              | 3   | (FSHN3102 + CR*) or PHYS2102                       |
| FSHN3109                               | Sensory Evaluation of Food                  | 3   | FSHN2101 + CR*                                     |
| FSHN4107                               | Milk and Milk Products                      | 3   | FSHN(3104, 3105, 3106) + CR*                       |

**J4. Minor in Human Nutrition (18 credits)**

| Course Code                            | Course Title                                  | Cr. | Pre-Requisite                                      |
|----------------------------------------|-----------------------------------------------|-----|----------------------------------------------------|
| FSHN2301                               | Introduction to Human Nutrition and Dietetics | 3   | FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604) |
| <b>Five courses from the following</b> |                                               |     |                                                    |
| FSHN2302                               | Principles of Biochemistry                    | 3   | BIOL2101, CHEM2101                                 |
| FSHN3305                               | Macronutrients in Human Nutrition             | 3   | FSHN2301, (BIOL2101 or CHEM2101)                   |
| FSHN3306                               | Micronutrients in Human Nutrition             | 3   | FSHN3305                                           |
| FSHN3307                               | Nutrition Assessment and Planning             | 3   | FSHN (2301, 3305)                                  |
| FSHN3111                               | Public Sanitation****                         | 3   | BIOL3441, FSHN2101                                 |
| FSHN3309                               | Life Cycle Nutrition                          | 3   | FSHN (2301, 3307)                                  |
| FSHN4306                               | Community Nutrition                           | 3   | FSHN(2301, 3307) + CR*                             |

\*\*\*\* Students who pass FSHN3075 cannot take FSHN3111

**J5. Minor in Marine Science and Fisheries (18 credits)**

| Course Code | Course Title                                                          | Cr. | Pre-Requisite                                      |
|-------------|-----------------------------------------------------------------------|-----|----------------------------------------------------|
| MASF2003    | Introduction to Marine Science and Fisheries                          | 3   | FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604) |
| MASFXXXX    | Any MASF2000/3000/4000 level courses (excluding University Electives) | 15  | Check pre-requisites                               |

**J6. Minor in Natural Resource Economics (18 credits)**

| Course Code                            | Course Title                                     | Cr. | Pre-Requisite                                      |
|----------------------------------------|--------------------------------------------------|-----|----------------------------------------------------|
| CAMS2003                               | Introduction to Food and Resource Economics      | 3   | FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604) |
| <b>Five courses from the following</b> |                                                  |     |                                                    |
| NREC3011                               | Economics of Fisheries Management                | 3   | CAMS2003                                           |
| NREC3101                               | Marketing of Agricultural and Fisheries Products | 3   | CAMS2003                                           |
| NREC3106                               | Social Survey Design and Analysis                | 3   | CAMS(2003, 3001)                                   |
| NREC3107                               | Food Service Systems- Operations Management      | 3   | FSHN2072 or NREC3101                               |
| NREC3300                               | Natural Resource and Environmental Economics     | 3   | CAMS2003                                           |
| NREC4103                               | Agribusiness Entrepreneurships                   | 3   | CR*                                                |
| NREC4230                               | Agricultural Finance                             | 3   | CR*                                                |
| NREC4430                               | Benefit Cost Analysis                            | 3   | CR*                                                |
| NREC4500                               | Extension Methods and Techniques                 | 3   | CR*                                                |

**J7. Minor in Soil Sciences (18 credits)**

| Course Code                            | Course Title                                                                        | Cr. | Pre-Requisite                                      |
|----------------------------------------|-------------------------------------------------------------------------------------|-----|----------------------------------------------------|
| SWAE2201                               | Introduction to Soil and Water                                                      | 3   | FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604) |
| <b>Five courses from the following</b> |                                                                                     |     |                                                    |
| SWAE3002                               | Desertification & Land Restoration                                                  | 3   | SWAE2201                                           |
| SWAE3302                               | Environmental Soil Chemistry                                                        | 3   | CHEM2101, SWAE2201                                 |
| SWAE3304                               | Soil and Water Conservation                                                         | 3   | PHYS2101, (SWAE2001or SWAE2201)                    |
| SWAE3311                               | Environmental Soil Physics                                                          | 3   | PHYS2101, (SWAE2001or SWAE2201)                    |
| SWAE3411                               | Environmental Soil Microbiology                                                     | 3   | BIOL2101                                           |
| SWAE4111                               | Hydropedology for Soil-Water-Landscape Interactions<br>Water-Landscape Interactions | 3   | SWAE(2201, 3303, 3311) + CR*                       |
| SWAE4401                               | Water and Nutrients in Soil-Plant Environments                                      | 3   | SWAE2201 + CR*                                     |
| SWAE4404                               | Soil Genesis and Classification                                                     | 3   | ERSC2101 or SWAE2201 + CR*                         |
| SWAE4412                               | Management of Salt-Affected Soils                                                   | 3   | SWAE2201 + CR*                                     |

**J8. Minor in Water Technology (18 credits)**

| Code                                   | Title                                     | Cr. | Pre-Requisite                                      |
|----------------------------------------|-------------------------------------------|-----|----------------------------------------------------|
| SWAE2201                               | Introduction to Soil and Water            | 3   | FPEL(0560 or 0600 or 0601 or 0602 or 0603 or 0604) |
| <b>Five courses from the following</b> |                                           |     |                                                    |
| SWAE3303                               | Elements of Hydrology                     | 3   | PHYS(2101 or 2107), SWAE(2201 or 2001)             |
| SWAE3310                               | Fundamentals of Fluid Mechanics           | 3   | MATH2107, PHYS(2101 or 2107)                       |
| SWAE3315                               | Water Quality                             | 3   | CHEM2101, SWAE2201                                 |
| SWAE3402                               | Irrigation Principles                     | 3   | SWAE2201                                           |
| SWAE4217                               | Transport of Chemicals in Porous Media    | 3   | SWAE(3303, 3311) + CR                              |
| SWAE4305                               | Water Control and Supply                  | 3   | SWAE(2201, 3310)+ CR*                              |
| SWAE4325                               | Water Treatment                           | 3   | CHEM2101, MATH2107, SWAE3315 + CR*                 |
| SWAE4400                               | Ground Water Hydrology                    | 3   | SWAE3303 + CR*                                     |
| SWAE4402                               | Design & Management of Irrigation Systems | 3   | SWAE(3310, 3402) + CR*                             |

**Minors outside CAMS (19 credits):****Minors from the College of Science****J9. Biology (19 credits)**

| Course Code | Course Title                                                                          | Cr. | Pre-Requisite |
|-------------|---------------------------------------------------------------------------------------|-----|---------------|
| BIOL2101    | General Biology I                                                                     | 4   |               |
| BIOLXXXX    | Any 2000/3000/4000 level courses in Biology ( <b>excluding University Electives</b> ) | 15  |               |

**J10. Chemistry (19 credits)**

| Course Code | Course Title                                                                            | Cr. | Pre-Requisite |
|-------------|-----------------------------------------------------------------------------------------|-----|---------------|
| CHEM2101    | General Chemistry I                                                                     | 4   | FPMT0105      |
| CHEMXXXX    | Any 2000/3000/4000 level courses in Chemistry ( <b>excluding University Electives</b> ) | 15  |               |

**J11. Computer Science (19 credits)**

| Course Code                            | Course Title                       | Cr. | Pre-Requisite                |
|----------------------------------------|------------------------------------|-----|------------------------------|
| COMP2101                               | Introduction to Computer Science   | 4   |                              |
| <b>Five Courses from the Following</b> |                                    |     |                              |
| COMP2103                               | Introduction to OOP                | 3   | COMP2101                     |
| COMP3314                               | Data Structures                    | 3   | COMP2103                     |
| COMP3518                               | Computer Org. & Assembly Lang.     | 3   | COMP3314, MATH3316           |
| COMP3316                               | Digital Logic & Switching Circuits | 3   | MATH3340                     |
| COMP4414                               | Database Management                | 3   | COMP3314                     |
| COMP4471                               | Computational Methods I            | 3   | COMP2101, MATH2108, MATH2202 |
| COMP4511                               | Introduction to Computer Graphics  | 3   | COMP3314, MATH2202           |
| COMP4513                               | Artificial Intelligence            | 3   | COMP3314, STAT2102           |
| COMP4517                               | Design and Analysis of Algorithms  | 3   | COMP3314                     |

**J12. Earth Science (19 credits)**

| Course Code                            | Course Title               | Cr. | Pre-Requisite                |
|----------------------------------------|----------------------------|-----|------------------------------|
| ERSC2101                               | Introduction to Geology I  | 4   |                              |
| <b>Five Courses from the Following</b> |                            |     |                              |
| ERSC2011                               | Palaeontology I            | 3   | ERSC2101                     |
| ERSC2102                               | Introduction to Geology II | 4   | ERSC2101                     |
| ERSC3001                               | Mineralogy I               | 3   | ERSC2102                     |
| ERSC3021                               | Structural Geology I       | 3   | ERSC2102                     |
| ERSC3041                               | Stratigraphy               | 3   | ERSC2011                     |
| ERSC3210                               | Palaeontology II           | 3   | ERSC2011                     |
| ERSC3301                               | Mineralogy II              | 3   | ERSC3001                     |
| ERSC4011                               | Igneous Petrology          | 3   | ERSC3301                     |
| ERSC4012                               | Metamorphic Petrology      | 3   | ERSC4011                     |
| ERSC4013                               | Sedimentary Petrography    | 3   | ERSC3001, ERSC3301           |
| ERSC4031                               | Geochemistry               | 3   | CHEM2101, CHEM2201, ERSC2102 |
| ERSC4041                               | Introduction to Geophysics | 3   | ERSC2101, PETR3246, PHYS2101 |
| ERSC4051                               | Hydrogeology               | 3   | CHEM3341, ERSC2101, PETR3246 |
| ERSC4321                               | Structural Geology II      | 3   | ERSC3021                     |
| ERSC5021                               | Marine Geology             | 3   | ERSC2102                     |

**J13. Mathematics (19 credits)**

| Course Code                            | Course Title                          | Cr. | Pre-Requisite                |
|----------------------------------------|---------------------------------------|-----|------------------------------|
| MATH1106                               | Pre-calculus                          | 4   |                              |
| <b>Five Courses from the Following</b> |                                       |     |                              |
| MATH2107                               | Calculus I                            | 3   | MATH1106                     |
| MATH2108                               | Calculus II                           | 3   | MATH2107                     |
| MATH2202                               | Linear Algebra I*                     | 3   | MATH1106                     |
| MATH3109                               | Calculus III*                         | 4   | MATH2108                     |
| MATH3171                               | Linear Algebra & Mult. Cal. for Eng.* | 3   | MATH2108                     |
| MATH3207                               | Math for Teachers I (Algebra)         | 3   | MATH2107                     |
| MATH3210                               | Math for Teachers II (Geometry)       | 3   | MATH2107                     |
| MATH3302                               | Ordinary Differential Equations       | 3   | MATH2108                     |
| MATH3360                               | Discrete Mathematics for CSs          | 3   | MATH2350                     |
| MATH3573                               | Graph Theory                          | 3   | MATH3340, MATH3350, MATH3357 |
| MATH3744                               | Introduction to Mathematical Modeling | 3   | MATH3109, MATH3302           |

\* Students who pass MATH3171 cannot take MATH2202 or MATH3110 and vice versa.

**J14. Physics (19 credits)**

| Course Code             | Course Title                                                                          | Cr. | Pre-Requisite |
|-------------------------|---------------------------------------------------------------------------------------|-----|---------------|
| PHYS2101 or<br>PHYS2107 | General Physics I or Physics for Engineering I                                        | 4   | FPMT0105      |
| PHYSXXXX                | Any 2000/3000/4000 level courses in Physics ( <b>excluding University Electives</b> ) | 15  |               |

**J15. Statistics (19 credits)**

| Course Code                            | Course Title                           | Cr. | Pre-Requisite       |
|----------------------------------------|----------------------------------------|-----|---------------------|
| STAT1001                               | Introduction to Statistics             | 4   | English             |
| <b>Five Courses from the Following</b> |                                        |     |                     |
| STAT2102                               | Introduction to Probability            | 3   | STAT1001, MATH2108* |
| STAT3334                               | Introduction to Inference              | 3   | STAT2102            |
| STAT3335                               | Sampling Techniques                    | 3   | STAT3334            |
| STAT3338                               | Statistical Methods                    | 3   | STAT3334            |
| STAT3336                               | Computational Techniques in Statistics | 3   | COMP2216, STAT2102  |
| STAT4432                               | Regression Analysis                    | 3   | STAT3334            |
| STAT4433                               | Design and Analysis of Experiments     | 3   | STAT3338            |
| STAT4434                               | Nonparametric Statistics               | 3   | STAT3334            |

**J16. Minor from College of Commerce (18 credits)**

Only Natural Resource Economics students are entitled for this minor. NREC students must successfully complete 6 from the following 9 courses

| Code     | Title                             | Cr. | Pre-Requisite        |
|----------|-----------------------------------|-----|----------------------|
| ACCT1112 | Introductory Financial Accounting | 3   |                      |
| MNGT1515 | Principles of Management          | 3   |                      |
| MNGT2515 | International Business            | 3   | MNGT1515             |
| ECON1211 | Principles of Microeconomics      | 3   |                      |
| ECON2221 | Principles of Macroeconomics      | 3   |                      |
| FINA3311 | Principles of Finance             | 3   | ACCT2121             |
| POMG2710 | Principles of management Science  | 3   | STAT1811             |
| POMG3711 | Operations Management             | 3   | POMG2710             |
| MRKT3611 | Principles of Marketing           | 3   | ECON 1211 & ECON2221 |

