Atmospheric sciences is a fast evolving discipline. Recently, atmospheric chemistry has become an important sub-discipline of atmospheric sciences, mostly in relationship with the new challenges Society is facing: air pollution, global climate and composition change, ozone hole. Reflecting this trend, the Department of Atmospheric and Oceanic Sciences and the Department of Chemistry have hired a second joint faculty in atmospheric chemistry in 2005. The new programme is a Major’s option which takes benefit of this enhanced expertise in order to allow undergraduate students in Atmospheric and Oceanic Sciences to acquire the multi-disciplinary understanding of atmospheric chemistry. This new programme can also be taken as a preparation for graduate studies in atmospheric chemistry.
### 8.0 Program Description (Maximum 150 words)

The Atmospheric Chemistry option is a multi-disciplinary programme which provides, in addition to the required courses in the Major Programme in Atmospheric Science, the basic knowledge of the theory of physical chemistry, some exposure to chemistry laboratory, together with an in-depth understanding of atmospheric chemistry.

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### 9.0 List of proposed program for the New Program/Major or Minor/Concentration.

If new concentration (option) of existing Major/Minor (program), please attach a program layout (list of all courses) of existing Major/Minor.

Proposed program (list courses as follows: Subj Code/Crse Num, Title, Credit weight under the headings of: Required Courses, Complementary Courses, Elective Courses)

#### Existing Major in Atmospheric Science (61 credits)

**Required Courses (46 credits)**

- ATOC 214 (3) Intro. to the physics of the atmosphere
- ATOC 215 (3) Ocean, weather and climate
- ATOC 309 (3) Weather, radars and satellites
- ATOC 315 (3) Water in the atmosphere
- ATOC 412 (3) Atmospheric dynamics
- ATOC 540 (3) Synoptic meteorology I
- ATOC 541 (3) Synoptic meteorology II
- ATOC 546 (1) Current weather discussion
- MATH 222 (3) Calculus III
- MATH 223 (3) Linear Algebra
- MATH 314 (3) Advanced Calculus
- MATH 315 (3) Ordinary differential equations
- PHYS 230 (3) Dynamics of simple systems
- PHYS 232 (3) Heat and waves
- PHYS 257 (3) Experimental methods
- COMP 208 (3) Computers in engineering

**Complementary Courses (15 credits)**

- 3-6 credits to satisfy a statistics requirement, usually:
  - MATH 203 Principles of Statistics I (3)
  - or MATH 323 Probability (3)
  - and MATH 324 Statistics (3)
- 3 credits selected from:
  - PHYS 333 Thermal and Statistical Physics (3)
  - PHYS 340 Electricity and Magnetism (3)
- 6-9 credits selected from:
  - CHEM/ATOC 419 Adv in Chem of Atmosphere (3)
  - ATOC 515 Turbulence in Atmosph and Oceans (3)
  - GEOG 322 Environmental Hydrology (3)
  - GEOG 372 Running Water Environments (3)
  - MATH 317 Numerical Analysis (3)
  - MATH 319 Partial Differential Equations (3)
  - MATH 423 Regression and Analysis of Variance (3)
  - PHYS 241 Signal Processing (3)
  - PHYS 331 Topics in Classical Mechanics (3)
  - PHYS 340 Electricity and Magnetism (3)
  - or MATH 555 Fluid Dynamics (3)
  - PHYS 340 Electricity and Magnetism (3)
  - PHYS 342 Electromagnetic Waves (3)

#### New Programme: Major in Atmospheric Science - Atmospheric Chemistry Option (61 credits)

**Required Courses (55 credits)**

- ATOC 214 (3) Intro. to the physics of the atmosphere
- ATOC 215 (3) Ocean, weather and climate
- ATOC 309 (3) Weather, radars and satellites
- ATOC 315 (3) Water in the atmosphere
- ATOC 412 (3) Atmospheric dynamics
- ATOC 540 (3) Synoptic meteorology I
- ATOC 541 (3) Synoptic meteorology II
- ATOC 546 (1) Current weather discussion
- MATH 222 (3) Calculus III
- MATH 223 (3) Linear Algebra
- MATH 314 (3) Advanced Calculus
- MATH 315 (3) Ordinary differential equations
- PHYS 230 (3) Dynamics of simple systems
- PHYS 232 (3) Heat and waves
- PHYS 257 (3) Experimental methods
- COMP 208 (3) Computers in engineering
- CHEM 223 Intro to Physical Chemistry I (2)
- CHEM 253 Intro to Physical Chemistry I Lab (1)
- CHEM 243 Intro to Physical Chemistry II (2)
- CHEM 263 Intro to Physical Chemistry II Lab (1)
- CHEM/ATOC 419 Adv in Chem of Atmosphere (3)

**Complementary Courses (6 credits)**

- 3 credits to satisfy a statistics requirement, usually:
  - MATH 203 Principles of Statistics I (3)
  - or MATH 324 Statistics (3)
- 3 credits selected from:
  - ATOC 515 Turbulence in Atmosph and Oceans (3)
  - MATH 317 Numerical Analysis (3)
  - MATH 319 Partial Differential Equations (3)
  - MATH 423 Regression and Analysis of Variance (3)
  - PHYS 241 Signal Processing (3)
  - PHYS 331 Topics in Classical Mechanics (3)
  - PHYS 333 Thermal and Statistical Physics (3)
  - PHYS 340 Electricity and Magnetism (3)
  - EPSC 542 Chemical Oceanography (3)
  - CHEM 307 Analytical Chemistry of Pollutants (3)
  - CHEM 367 Instrumental Analysis I (3)
  - CHEM 575 Chemical Kinetics (3)

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Attach extra page(s) as needed
## 10.0 Approvals

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Submitted by

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To be completed by ARR:

- CIP Code