Biology
Chemistry
Physics & Energy Studies

MOR E THAN A SCHOLARSHIP
JOIN TSP
Why Choose Bachelor of Science in an Academic Discipline and in Education Programmes at NIE?

- The Bachelor of Science (Academic Discipline & Education) programmes at NIE integrate the best of an academic degree with a strong foundation in the field of education to produce graduates with the knowledge and skills to excel in careers in education-related fields.
- The curriculum is designed to be broad-based and flexible with the rigour expected of any internationally recognised undergraduate programme.
- The programmes prepare student teachers for primary or secondary teaching.
- Graduates are prepared to pursue advanced qualifications both in the academic disciplines and in the field of education.
- Courses are taught by world renowned academics in both content and education fields.

For details on the Bachelor of Science (Academic Discipline & Education) programmes at NIE, please refer to the website at [http://www.nie.edu.sg/teacher-education/undergraduate-programmes](http://www.nie.edu.sg/teacher-education/undergraduate-programmes)

Highlights of the Bachelor of Science (Academic Discipline & Education) Programmes

- Four-year Honours programme leading to the award of the Bachelor of Science in an Academic Discipline and in Education degree.
- Small class sizes.
- Innovative Pedagogy (e.g., Inquiry-Based Learning and Flipped classroom).
- School experience / teaching practicum spread over four years.
- Opportunities for subject area and education research.

The NTU-NIE Teaching Scholars Programme

The NTU-NIE Teaching Scholars Programme (TSP) is one of NTU's Premier Scholars’ Programmes (PSP). It is a prestigious award for outstanding scholars with a passion and calling to be professional leaders in education. TSP is a 4-year programme that includes:

- An exciting multidisciplinary curriculum that encompasses electives from NTU’s University Scholars Programme.
- Seminars by distinguished Professors, Nobel Laureates, government leaders and industry luminaries as well as personal guidance from NIE faculty members.
- Acquiring of research skills under the mentorship of eminent advisors.
- Opportunity to participate in the Undergraduate Research Experience on Campus (URECA), a university wide programme that cultivates a culture of rigour and curiosity.
- Unparalleled opportunities for international exposure through overseas students’ exchange and teaching practicum in different education systems.
- TSP Scholars will be familiar with education policies in the dynamic changing education landscape and equip themselves with knowledge to impact learning in the schools.
- Acquiring of a broad-based knowledge that will enable TSP Scholars to become well rounded individuals equipped with real-world experiences to guide the youth of tomorrow.

For details on the TSP, please refer to the website at [https://www.ntu.edu.sg/nie/programmes/undergraduate-programmes/teaching-scholars-programme](https://www.ntu.edu.sg/nie/programmes/undergraduate-programmes/teaching-scholars-programme)
1. **Special Academic Subject Requirements**

**Biology**
- A pass at GCE 'A' Level in Biology
- A pass at H2 level Biology
- A pass at Higher level in Biology (IB Diploma)
- At least a major CAP of 2.0 for NUS High School Diploma in Biology
- A good pass at GCE 'O' Level in Biology
- At least an overall CAP of 3.5 for NUS High School Diploma in Biology
- A good polytechnic diploma in approved Biology-related disciplines

**Chemistry**
- A pass at GCE 'A' Level in Chemistry AND GCE 'AO' Level in Mathematics
- A pass at H2 level in Chemistry AND a pass in H1 level in Mathematics
- A pass at Higher level in Chemistry (IB Diploma) AND a pass at standard level in Mathematics (IB Diploma)
- At least a major CAP of 2.0 for NUS High School Diploma in Chemistry AND an overall CAP of 2.0 for NUS High School Diploma in Mathematics
- A good polytechnic diploma in approved Chemistry-related disciplines

**Physics & Energy Studies**
- A pass at GCE 'A' Level in Physics AND a pass at GCE 'AO' Level in Mathematics
- A pass at H2 level in Physics AND a pass in H1 level in Mathematics
- A pass in Higher level in Physics (IB Diploma) and a pass at standard level in Mathematics (IB Diploma)
- At least a major CAP of 2.0 for NUS High School Diploma in Physics AND an overall CAP of 2.0 for NUS High School Diploma in Mathematics
- A good polytechnic diploma in approved Physics-related disciplines
2. *Bachelor of Science in Biology and Education*

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<thead>
<tr>
<th>Year</th>
<th>Category*</th>
<th>Course Code &amp; Title</th>
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<tbody>
<tr>
<td>ONE</td>
<td>AS</td>
<td>AAB10A Evolution, Diversity and Ecosystems</td>
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<tr>
<td></td>
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<td>AAB10B Physiological and Biochemical Basis of Life</td>
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<td>AAB10C Basic Molecular Genetics and Microbiology</td>
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<td>AAB10D Cell Structure and Function</td>
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<td></td>
<td>SK (Pri only)</td>
<td>ASK10B Topics in Physical Sciences for Primary Science Teaching</td>
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<td></td>
<td>AS</td>
<td>AAB20A Current Genetics</td>
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<td></td>
<td>AAB20B Plant Evolution and Diversity</td>
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<td>AAB20C Animal Evolution and Diversity</td>
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<td></td>
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<td>AAB20D Ecology</td>
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<td></td>
<td></td>
<td>AAB20E Quantitative Biology</td>
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<td></td>
<td></td>
<td>AAB20G Biochemistry</td>
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<td></td>
<td>CS</td>
<td><strong>Primary</strong> ACS20A Curriculum and Practices for Primary Science</td>
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<td></td>
<td><strong>Secondary</strong> ACB22A Curriculum and Scientific Practices in Biology Education</td>
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<tr>
<td></td>
<td>AS</td>
<td>AAB30A Field Study of Ecosystem Diversity in a Changing World</td>
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<td>AAB30C Animal Physiology</td>
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<td></td>
<td></td>
<td>AAB30D Plant Physiology</td>
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<tr>
<td></td>
<td>CS</td>
<td><strong>Primary</strong> ACS30A Pedagogies for Primary Science</td>
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<td><strong>Secondary</strong> ACB32A Pedagogies of Biology Education</td>
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<td></td>
<td>ES</td>
<td>AED40A Educational Research</td>
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<td></td>
<td>or AED430 Research Project <em>(NIE-NTU TSP)</em></td>
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<td></td>
<td>AS</td>
<td>AAB40A Molecular Biotechnology</td>
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<td></td>
<td>AAB40B Behavioural Biology</td>
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<tr>
<td></td>
<td></td>
<td>AAB40C Developmental Biology</td>
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<tr>
<td></td>
<td></td>
<td>AAB40D Academic Exercise: Biology</td>
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<td></td>
<td>CS</td>
<td><strong>Primary</strong> ACS40A Innovations in Design and Practices for Primary Science</td>
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<td>ACS40B Meeting Learners’ Needs in Primary Science</td>
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<td><strong>Secondary</strong> ACB42A Assessment in Biology</td>
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<td>ACB42B Innovative Biology Teaching</td>
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</tbody>
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*AS = Academic Subjects, CS = Curriculum Studies, ES = Education Studies, SK = Subject Knowledge*

In addition to the above courses, student teachers will take courses in *Education Studies (ES), Academic Subjects as AS2 (Secondary track only), Language Enhancement and Academic Discourse Skills, General Electives and Essential Course* as well as *Practicum.*

For more information, please visit:
[https://www.ntu.edu.sg/nie/programmes/undergraduate-programmes](https://www.ntu.edu.sg/nie/programmes/undergraduate-programmes)
3. Bachelor of Science in Chemistry and Education

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<tr>
<th>Year</th>
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| ONE  | AS        | AAY10A Inorganic Chemistry I  
|      |           | AAY10B Physical Chemistry I  
|      |           | AAY10C Physical Chemistry II  
|      |           | AAY10D Organic Chemistry I  
|      | SK (Pri only) | ASK10B Topics in Physical Sciences for Primary Science Teaching |
|      | AS        | AAY20A Organic Spectroscopy Techniques and Applications  
|      |           | AAY20B Analytical Chemistry I  
|      |           | AAY20C Inorganic Chemistry II  
|      |           | AAY20D Organic Chemistry II  
|      |           | AAY20E Experimental Techniques in Chemistry  
|      |           | AAY20G Organometallic Chemistry  
| TWO  | AS        | AAY30A Analytical Chemistry II  
|      |           | AAY30B Medicinal Chemistry  
|      | CS        | Primary  
|      |           | ACS30A Pedagogies for Primary Science  
|      |           | Secondary  
|      |           | ACY32A Chemistry Planning and Instruction  
|      | ES        | AED40A Educational Research  
|      |           | or AED430 Research Project (NIE-NTU TSP)  
| THREE| AS        | AAY40A Bioinorganic Chemistry  
|      |           | AAY40B Academic Exercise: Chemistry  
|      |           | AAY40C Materials Chemistry  
|      |           | AAY40D Environmental Chemistry  
|      | CS        | Primary  
|      |           | ACS40A Innovations in Design and Practices for Primary Science  
|      |           | ACS40B Meeting Learners’ Needs in Primary Science  
|      |           | Secondary  
|      |           | ACY42A Assessment and Laboratory Issues in Chemistry  
|      |           | ACY42B Trends, Issues and Challenges in Chemistry Education  
|      | SK (Pri only) | ASK40A Topics in Biological Science for Primary Science Teaching  

* AS = Academic Subjects, CS = Curriculum Studies, ES = Education Studies, SK = Subject Knowledge

In addition to the above courses, student teachers will take courses in Education Studies (ES), Academic Subjects as AS2 (Secondary track only), Language Enhancement and Academic Discourse Skills, General Electives and Essential Course as well as Practicum.

For more information, please visit: https://www.ntu.edu.sg/nie/programmes/undergraduate-programmes
4. **Bachelor of Science in Physics & Energy Studies and Education**

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<tr>
<th>Year</th>
<th>Category*</th>
<th>Course Code &amp; Title</th>
</tr>
</thead>
</table>
| ONE  | AS        | AAP10A  Mechanics with Laboratory  
* AAP10B  Thermal Physics with Laboratory  
* AAP10C  Electricity and Magnetism with Laboratory  
* AAP10D  Optics & waves with Laboratory  |
|      | AS        | AAP20A  Modern Physics  
* AAP20B  Electromagnetism  
* AAP20C  Quantum Mechanics  
* AAP20D  Electronics  
* AAP20E  Physics Laboratory I  
* AAP20G  Solid State Physics  |
|      | CS        | **Primary**  
* ACS20A  Curriculum and Practices for Primary Science  
**Secondary**  
* ACP22A  Understanding the Physics Curriculum  |
| THREE| AS        | AAP30A  Lasers and Photonics  
* AAP30B  Physics Laboratory II  
* AAP30C  Semiconductor Physics and Devices  |
|      | CS        | Primary  
* ACS30A  Pedagogies for Primary Science  
Secondary  
* ACP32A  Physics Instruction and Microteaching  |
|      | ES        | AED40A  Educational Research  
or  
* AED430  Research Project (NIE-NTU TSP)  |
| FOUR | AS        | AAP40A  Nuclear Physics  
* AAP40B  Plasma Physics and Nuclear Fusion  
* AAP40D  Academic Exercise: Physics & Energy Studies  
Select any 1 Elective:  
* AAP43A  Biomedical Physics  
* AAP43B  Molecular Physics  
* AAP43C  Nanoscience  |
|      | CS        | Primary  
* ACS40A  Innovations in Design and Practices for Primary Science  
* ACS40B  Meeting Learners’ Needs in Primary Science  
Secondary  
* ACP42A  Assessment in Physics Education  
* ACP42B  Reflective Teaching and Inquiry in Physics  |
|      | SK        | (Pri only)  
* ASK40A  Topics in Biological Science for Primary Science Teaching  |

* AS = Academic Subjects, CS = Curriculum Studies, ES = Education Studies, SK = Subject Knowledge

In addition to the above courses, student teachers will take courses in Education Studies (ES), Academic Subjects as AS2 (Secondary track only), Language Enhancement and Academic Discourse Skills, General Electives and Essential Course as well as Practicum.

For more information, please visit:  
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