1. You are advised to read the instructions to courses registration posted in STARS. Please refer to STARS for the schedule of registration.

2. Students in Physics with 2nd Major in Mathematical Sciences should also refer to the instructions for programme in Mathematical Sciences. Regardless of the admission year, the normal load for this programme is 22 AU and the maximum load is 25 AU. When you are registering a course that will exceed your normal load, you can only do so after 5pm on your course registration day. If you wish to read a course that will exceed your maximum load, you can apply online through this link: http://spms-appserver5.staff.main.ntu.edu.sg/overload/apply/default.aspx. You should submit the overload application after the result of GER-PE and UE allocation is known. Please note that approval is granted to a specific course that you wish to overload and it may depend on your past satisfactory academic performance. You are advised to plan ahead as approval takes several days.

3. The following courses are to be read during Semester 1 AY 2018/2019 (subject to pre-requisites).

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Course Type</th>
<th>Course AU</th>
</tr>
</thead>
<tbody>
<tr>
<td>PH1104</td>
<td>Mechanics</td>
<td>Core</td>
<td>3</td>
</tr>
<tr>
<td>PH1105</td>
<td>Optics, Vibrations and Waves</td>
<td>Core</td>
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<tr>
<td>PH1198</td>
<td>Physics Laboratory Ia</td>
<td>Core</td>
<td>2</td>
</tr>
<tr>
<td>*MH1401</td>
<td>Algorithms and Computing I</td>
<td>Core</td>
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<tr>
<td>MH1802</td>
<td>Calculus for the Sciences</td>
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<tr>
<td>MH1200</td>
<td>Linear Algebra I</td>
<td>UE</td>
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<tr>
<td>MH1300</td>
<td>Foundations of Mathematics</td>
<td>UE</td>
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<tr>
<td>*ML0001</td>
<td>Absolute Basics for Career</td>
<td>GER-CORE</td>
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<td>#PS0001</td>
<td>Introduction to Computational Thinking</td>
<td>GER-CORE</td>
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<td>HW0001</td>
<td>English Proficiency (for students who failed QET in Semester 2 or failed HW0001 in Semester 1)</td>
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*Applicable to AY14 to AY17 students

#Applicable to AY18 students onwards
*Applicable to AY16 and earlier*

### PHMA – AMAS Year 3

<table>
<thead>
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<th>Course Type</th>
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<tbody>
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<td>Quantum Mechanics II</td>
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</tr>
<tr>
<td>PH3102</td>
<td>Condensed Matter Physics I</td>
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<tr>
<td>MH3101</td>
<td>Complex Analysis</td>
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<tr>
<td>MH3101</td>
<td>Complex Analysis</td>
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</tr>
<tr>
<td>MH3600</td>
<td>Knots and Surfaces: Introduction to Topology</td>
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<td>Condensed Matter Physics I</td>
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<tr>
<td>MH3510</td>
<td>Regression Analysis</td>
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### PHMA - AMAS Major PE

<table>
<thead>
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<td>Cosmology</td>
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<td>PH3404</td>
<td>Physics of Classical and Quantum Information</td>
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<td>Superconductivity, Superfluidity and Bose-Einstein Condensates</td>
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<td>PH3502</td>
<td>Chaotic Dynamical System</td>
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<tr>
<td>PH4402</td>
<td>Condensed Matter Physics II</td>
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<tr>
<td>PH4403</td>
<td>Surfaces and Interfaces</td>
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<tr>
<td>PH4408</td>
<td>Nuclear Physics</td>
<td>Major PE</td>
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<td>PH4411</td>
<td>Introduction to Experimental Particle Physics</td>
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<td>PH4507</td>
<td>Topics in Physics</td>
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<td>PH4407</td>
<td>Professional Internship</td>
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<td>Graph Theory</td>
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<td>MH3512</td>
<td>Stochastic Processes</td>
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<td>MH4311</td>
<td>Cryptography</td>
<td>Major PE</td>
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<td>Numerical Analysis II</td>
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<td>MH4701</td>
<td>Mathematical Programming</td>
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<td>MH4702</td>
<td>Probabilistic Methods in OR</td>
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<td>MH4920</td>
<td>Supervised Independent Study I</td>
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<td>MH4921</td>
<td>Supervised Independent Study II</td>
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<td>Algorithms</td>
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<td>CZ4042</td>
<td>Neural Networks</td>
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<td>EE4476</td>
<td>Image Processing</td>
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</tbody>
</table>
4. You are allowed to read higher level courses provided that you have met the pre-requisites and there are vacancies available. Pre-requisites may also be met through exemptions.

5. The location of the Mathematics Labs is as follow.

<table>
<thead>
<tr>
<th>Mathematics Lab</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP LAB 1</td>
<td>SPMS-MAS-03-02</td>
</tr>
<tr>
<td>COMP LAB 2</td>
<td>SPMS-MAS-03-03</td>
</tr>
<tr>
<td>COMP LAB 3</td>
<td>SPMS-MAS-03-04</td>
</tr>
</tbody>
</table>

6. Students with Admission Year 2017 and are intending to take up second major in Mathematical Sciences are to take note of the mutually exclusive condition of the mathematics courses.
7. Students who are interested may take graduate courses as prescribed electives or unrestricted electives. A minimum CGPA of 4.00 is required for the application. Students will be required to fulfill at least 10 AU of level 4 [excluding PH4405 Final Year project (10 AU) or PH4407 Professional Internship (10 AU)] and above courses as part of their graduation requirement under Major PE. Graduate course information may be found from [http://www.spms.ntu.edu.sg/pap/Graduates/TimeTableForGraduate.html](http://www.spms.ntu.edu.sg/pap/Graduates/TimeTableForGraduate.html).

Students may write in to Miss Tan Soo Pei, Juliet ([JulietTanSP@ntu.edu.sg](mailto:JulietTanSP@ntu.edu.sg)) for more details on the application process.

These are the graduate courses offered in AY 2018/2019 Semester 1:
- PAP711: Graduate Solid State Physics
- PAP738: Advanced Topics in Physics
- PAP739: Advanced Topics in Applied Physics

Please note that PAP711 is mutually exclusive with PH4402; PAP710 is mutually exclusive with PH4501. PAP739 is mutually exclusive with PH4604. PAP738 is mutually exclusive with PH4507. This application is subject to approval.

8. Students who have taken courses as pre-requisites during exchange programme in the current Semester, please write in to SPMSundgrad@ntu.edu.sg with your course mapping approval, screenshot of registered courses in the overseas university and results slip/transcript (if available).

9. Students who are interested to take PH4507 and/or PH4604 may fill up the application form. More information on these courses will be made notice to students via email.

10. Enquiries on curriculum may be directed to:
- Assoc Prof Sun Handong ([HDSun@ntu.edu.sg](mailto:HDSun@ntu.edu.sg))
- Miss Tan Soo Pei, Juliet ([JulietTanSP@ntu.edu.sg](mailto:JulietTanSP@ntu.edu.sg))
- Mr Chris Tan ([zjtan@ntu.edu.sg](mailto:zjtan@ntu.edu.sg)) – Math Curriculum

11. Enquiries on courses registration may be directed to SPMSundgrad@ntu.edu.sg. Your matriculation number must always be included in your e-mail. Please refrain from sending multiple similar e-mails as this will not expedite the response but rather it will cause undue delay. All enquiries will be attended to and will be replied as soon as possible, depending on the nature of the request. Appeals for GER-PE and UE vacancies are to be submitted through the online appeal system and will not be responded to if submitted otherwise.

12. Enquiries on network performance, Studentlink password, STARS PIN or iNTULearn may be directed to NSS Servicedesk ([Servicedesk@ntu.edu.sg](mailto:Servicedesk@ntu.edu.sg)).