3.3.5.4.1 Double Major in Business Analytics

The School of Computing offers a second major in Business Analytics (BZA) for non-SoC students.

Objectives

The objectives for the Second Major in BZA are as follows:

To provide a business analytics programme within NUS for non-computing students who are not studying business analytics and equivalent as the first major;
To contribute to the national focus on growing the pool of knowledge workers who have foundational skill set in business analytics;
To produce graduates who are able to understand business analytics principles and practices and apply it in a multi-disciplinary context.

Student Learning Outcomes

The Second Major in BZA enables students to attain, by the time of graduation:

1. Strong knowledge of business analytics foundations and fundamentals, including (a) familiarity with common business analytics themes and principles, (b) high-level understanding of systems as a whole, (c) understanding of the theoretical underpinnings of business analytics and their influences in practice.
2. Individual competence in applying sound principles and rigorous thinking to (a) analyse a business problem, (b) formulate the problem in terms of analytics requirements, (c) conceive novel solution ideas, (d) design appropriate solutions that meet the requirements, (e) implement the solution, (f) evaluate the effectiveness of the solution.
3. An ability to function effectively in teams to accomplish a common goal.
4. Recognition of the need for and an ability to engage in continuing professional development.

Admission Requirements

For direct admission, students applying for the Second Major in BZA must meet the entry requirement:

For diploma holders: Diploma with at least an A2 in GCE ‘O’ level Elementary Mathematics or at least a B4 grade in GCE ‘O’ level Additional Mathematics.
For A-Level Holders: At least a H2 pass in Mathematics.

Existing students from cohort 2016/17 or later who have taken CS1010S (or its equivalent) and BT1101 (or its equivalent) as either part of their degree requirements or Minor in Business Analytics can apply for entry into Second Major in Business Analytics if they obtain B+ or above in both modules.

The second major in BZA programme is not available to students in the following degree programmes:

BComp (Information Security)
BComp (Computer Science)
BComp (Computational Biology)
BComp (Information Systems)
BSc (Business Analytics)
BSc (Data Science and Analytics)

In addition, BBA and BBA (Accountancy) students who are matriculated from AY2017/18 onwards and specialised in Business Analytics are not allowed to graduate with a second major in Business Analytics.

**Structure**

The Second Major in BZA to be structured as follows:

- Business Analytics Foundation = 40 MCs
- Business Analytics Verticals = 8 MCs

In total, the 48 MCs requirement for graduation are broken down as follows:

- Core modules = 40 MCs
- Elective modules = 8 MCs

The table below shows the programme structure in details:

<table>
<thead>
<tr>
<th>Modules</th>
<th>MCs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Business Analytics Foundation</strong></td>
<td>40</td>
</tr>
<tr>
<td>BT1101 Introduction to Business Analytics¹</td>
<td>4</td>
</tr>
<tr>
<td>BT2101 Decision Making Methods and Tools</td>
<td>4</td>
</tr>
<tr>
<td>BT2102 Data Management and Visualisation</td>
<td>4</td>
</tr>
<tr>
<td>BT3102 Computational Methods for Business Analytics</td>
<td>4</td>
</tr>
<tr>
<td>BT3103 Application Systems Development for Business Analytics</td>
<td>4</td>
</tr>
<tr>
<td>CS1010S Programming Methodology²</td>
<td>4</td>
</tr>
<tr>
<td>CS2030 Programming Methodology II and CS2040/C Data Structures and Algorithms</td>
<td>8</td>
</tr>
<tr>
<td>ST2334 Probability and Statistics³</td>
<td>4</td>
</tr>
</tbody>
</table>
Complete 8 MCs of modules in the list below:

- BT4211 Data-Driven Marketing
- BT4212 Search Engine Optimization and Analytics
- BT4221 Big Data Techniques and Technologies
- BT4222 Mining Web Data for Business Insights
- IS3221 Enterprise Resource Planning Systems
- IS4241 Social Media Network Analysis

**Grand Total**

<table>
<thead>
<tr>
<th>Module Description</th>
<th>MCs</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST3131 Regression Analysis or BT4240 Machine Learning for Predictive Data Analytics</td>
<td>4</td>
</tr>
<tr>
<td><strong>Business Analytics Verticals</strong></td>
<td>8</td>
</tr>
<tr>
<td>Complete 8 MCs of modules in the list above:</td>
<td>4</td>
</tr>
<tr>
<td>BT4211 Data-Driven Marketing</td>
<td>4</td>
</tr>
<tr>
<td>BT4212 Search Engine Optimization and Analytics</td>
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<td>IS3221 Enterprise Resource Planning Systems</td>
<td>4</td>
</tr>
<tr>
<td>IS4241 Social Media Network Analysis</td>
<td>4</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td>48</td>
</tr>
</tbody>
</table>

1. BT1101 can be replaced by DSC1007.
2. CS1010S can be replaced by CS1101S/CS1010/E/S/X/FC/J. But students need to apply for the module substitution as advanced modules may need the taught programming language in CS1010S and it is imperative that students who take CS1010S equivalent are aware of it. Students who are waived from completing CS1010 or its equivalent must complete another 4 MCs of electives under Business Analytics Verticals.
3. CS1020 can be replaced by CS1020E.
4. ST2334 can be replaced by ST2131 (Probability) or ST2132 (Mathematical Statistics).

Some of these modules require prerequisites from outside this list. Students must have the prerequisites to take them.

**Continuation and Graduation Requirements**

The Second Major in BZA is a non-Honours major programme.

The Second Major in BZA will be awarded to students who completed the 48 MCs second major requirement. Students will need to complete the primary major requirements to graduate.

For students following the grade-free first semester policy for S/U option or the enhanced grade-free scheme for S/U Policy: The S/U option is available for modules that are part of a student’s second Major requirements if they fall under the criteria stated for their cohort, and as long as the student has at least a minimum 32 MCs of the Second Major requirement earned from modules read in NUS (i.e., graded modules with assigned grade points or modules with an ‘S’ or ‘CS’ grade) out of the 48 MCs to fulfill the
Second Major requirements towards graduation.

As a continuation requirement, students taking the Second Major in BZA need to obtain at least a B+ grade in both CS1010S (or its equivalent) and BT1101 (or its equivalent). Should S/U option be chosen by students for either (or both) module(s), the raw performance in the module(s), i.e., based on the B+ equivalent marks, will be reviewed. Should a student fail to obtain the grade of B+ and above for both modules, he/she can apply to downgrade to taking the Minor in Business Analytics.

**Double Counting Framework for Double Major Programme**

For 2014 cohort and beyond, 16 MCs of the 48-MC second major can be double counted with the primary major/programme requirements.