Annexe A: New/Revised Course Content in OBTL+ Format

Course Overview

The sections shown on this interface are based on the templates UG OBTL+ or PG OBTL+
If you are revising/duplicating an existing course and do not see the pre-filled contents you expect in the subsequent sections e.g. Course Aims, Intended Learning Outcomes etc. please refer to Data Transformation Status for more information.

Expected Implementation in Academic Year	AY2024/2025
Semester/Trimester/Others (specify approx. Start/End date)	Semester 1
Course Author * Faculty proposing/revising the course	Wendy Tan Kim Suan
Course Author Email	wendytan@ntu.edu.sg
Course Title	Accounting and Audit Analytics
Course Code	AB5103
Academic Units	3
Contact Hours	39
Research Experience Components	Not Applicable

Course Requisites (if applicable)

Pre-requisites	AC2104 Assurance & Auditing
Co-requisites	
Pre-requisite to	
Mutually exclusive to	
Replacement course to	
Remarks (if any)	

Course Aims

With a rapidly changing regulatory environment, stakeholders are demanding more confidence and value from accounting and audit, particularly with the emergence of technologies such as data analytics. Data analytics is significantly changing the way accountants and auditors approach their day-to-day work, where data is now brought to life to allow an in-depth analysis from a business partnering and audit perspective.

This course examines the application of data analytics in accounting and audit based on relevant techniques with real-life examples. This course is designed for students who are keen to apply what they have learnt in other courses as well as within the course to real-life examples as they learn about practical aspects in the accounting and audit analytics process such as extraction, transformation and loading of data as well as the actual accounting and audit analytics techniques and visualisation of the results in software such as Microsoft Power BI.

Course's Intended Learning Outcomes (ILOs)

Upon the successful completion of this course, you (student) would be able to:

ILO 1	1) Describe what is data analytics in accounting and audit
ILO 2	2) Apply basic skills on SQL to develop insights in accounting and audit
ILO 3	3) Apply basic skills on a visualisation tool like Microsoft Power BI to develop insights in businesses
ILO 4	4) Evaluate the practical considerations when applying data analytics in accounting and audit
ILO 5	5) Conceptualise the application of accounting and audit analytics through development of prototype dashboards.

Course Content

- Introduction to the course
  - What is Data Analytics
  - Types of Data Analytics

- Data Analytics Process
  - Extract the data
  - Understanding of relational tables in database
  - Methods of data extraction

  - Prepare the data for use
  - Data formats
  - Conversion of data formats
  - Use of SQL/Excel

  - Run the analytics routines
  - Use of SQL/Excel

- Data Visualisation Process
  - Introduction to Data Visualisation
  - Use of Power BI
  - Power Query Editor
  - Data import and transformation with Power BI
  - Statistics with Power BI
  - Visualising Data with Power BI Report
  - Analysing Data with Power BI
  - Data Modelling with Power BI

- Application of Data Analytics in Accounting and Audit
  - Planning
  - Exploratory data analytics
  - Understanding of entity and its environment
  - Preliminary analytical procedures
  - Understanding of data population

  - Execution of data analytics procedures
  - Audit: Substantive procedures
  - Accounting: Analysis of business drivers

  - Evaluation of results
  - Audit: Interpretation of audit analytics results – dealing with exceptions
  - Accounting: Creation of dashboard for finance/business users

- Development of prototype dashboard(s) for final project and presentation

Reading and References (if applicable)

Textbook:

ADAG: Audit Data Analytics Guide, Association of International Certified Professional Accountants (AICPA), 2017.

Audit Guidance Statement (AGS 13): Data Analytics in a Financial Statements Audit, Institute of Singapore Chartered Accountants (ISCA), 2021.

Other Resources:

The Singapore Standards on Auditing (SSAs) and other pronouncements related to auditing and data analytics issued by the Institute of Singapore Chartered Accountants (ISCA) are available at: http://isca.org.sg/tkc/aa/standards/standards/

Articles and other required readings will be assigned over the course of the semester and posted on NTULearn site.

Planned Schedule

Week or Session	Topics or Themes	ILO	Readings	Delivery Mode	Activities
1	Introduction to the course • What is Data Analytics • Types of Data Analytics	ILO1	ADAG: Ch 1 AGS13: Para 12-17	In-person	
2	Data Analytics Process (1) • Extract the data • Understanding of relational tables in database • Methods of data extraction • Prepare the data for use • Data formats • Conversion of data formats • Use of SQL	ILO2	N/A	In-person	
3	Data Analytics Process (2) • Run the analytics routines • Use of SQL	ILO2	N/A	In-person	
4	Data Visualisation Process (1) • Introduction to Data Visualisatoin • Use of Power BI • Power Query Editor • Data import and transformation • Statistics	ILO3	N/A	In-person	

Week or Session	Topics or Themes	ILO	Readings	Delivery Mode	Activities
5	Data Visualisation Process (2) • Use of Power BI • Visualising data with Power BI Report (Bar chart, hierarchy with drill controls, matrix with conditional formatting) • Analysing data with Power BI (Line chart – including dual axis, scatter chart, filters, calculated columns vs calculated measures, pie and donut chart, slicer, card and text box) • Data modelling with Power BI (Data cardinality, creating relationships, filter directions)	ILO3	N.A.	In-person	
6	Application of Data Analytics in Audit (1) • Plan the audit • Exploratory data analytics • Obtain understanding of entity and its environment • Perform preliminary analytical procedures • Identify and assess risk of material misstatement • Design tailored audit procedures • Obtain an understanding of a population	ILO4, ILO5	ADAG: Ch 2 SSA 315 & 500	In-person	
7	Mock Quiz (Ungraded Simulation of In-Class Quiz)	ILO2, ILO3	Mock Quiz	In-person	

Week or Session	Topics or Themes	ILO	Readings	Delivery Mode	Activities
8	Application of Data Analytics in Audit (2) • Tests of operating effectiveness of controls • Perform substantive procedures In-class Quiz	ILO4, ILO5 / ILO2, ILO3	ADAG: Ch 3 AGS13: Para 69 - 126 In-class Quiz	In-person	
9	Application of Data Analytics in Accounting (1) • Financial Statement Analytics Team project briefing	ILO4, ILO5	N.A.	In-person	
10	Application of Data Analytics in Audit (3) • Evaluate results • Types of misstatements • Exceptions due to imprecision in expected outcome • Deviations in a nonmonetary test • Errors identified through other types of testing • Concluding analytical procedures Project Consultation	ILO4, ILO5	ADAG: Ch 4	In-person	
11	Application of Data Analytics in Accounting (2) • Management Analytics Project Consultation	ILO4, ILO5	N/A	In-person	
12	Development of prototype analytics solution(s) and consultation for final project and presentation	ILO2, ILO3, ILO4, ILO5	N/A	In-person	
13	Final presentation to instructor on prototype analytics solution(s)	ILO2, ILO3, ILO4, ILO5	Final presentation and submission of report	In-person	

Learning and Teaching Approach

Approach	How does this approach support you in achieving the learning outcomes?
Seminars (Data Analytics Process)	The interactive seminar session where you will learn some basic skills in Structured Query Language (SQL) as well as data visualization tool like Microsoft Power BI to prepare you for the individual in-class quiz and be able to apply the skillsets learned in the team project.
Seminars (Application of Data Analytics in Accounting and Audit)	The interactive seminar session where the instructor will share with you how data analytics is applied in accounting and audit with real practical examples on such applications. We will also be having open discussion on conceptual questions surrounding such applications, something that is not set in stone at the moment by the profession. The seminars are meant to show you the possibilities of what you can do with data analytics, and will help give you context as you try to conceptualise its application in your team project.
Consultation with instructor on team project	Specific weeks will be dedicated toward development of the final solution for the team project and during these sessions, you will be able to seek feedback on your team project such that you are guided in the course of your preparation toward the final deliverable and presentation.
In-class MCQ Assessments	MCQ-type assignments will be assigned online to students for them to complete within a designated time-frame after completion of specific week. This is meant to test students' understanding of the basic and fundamental concepts taught in class.
All seminars will be conducted in-class, unless otherwise communicated by the instructors.	

Planned no. of hours for learning activities (across entire course)

'Learning activities' refer to the range of activities students will engage in, in-person and online, to acquire the course's intended learning outcomes.

No.	Category	Planned no. of hours
1	Lecture-based sessions Learning activities where primarily, students receive content and perform notetaking.	0
2	Participation-based classroom sessions (Tutorials, Seminars, Studios) Learning activities where primarily, students are expected to engage actively with the instructor, their peers and the content.	39
3	In-house practical sessions (Labs) Learning activities where students engage in hands-on activities to conduct experiments, with the guidance of instructors, alongside peers, within the NTU campus.	0
4	In-house practical sessions (Practicum) Learning activities where students engage in hands-on activities, with the guidance of instructors, alongside peers, within the NTU campus.	0
5	Self/Group learning (without instructor) Learning activities where students are expected to engage in independent learning. For example, preparing for classes, labs and practicum, engaging in readings, completing quizzes or tasks.	0
6	Others Please specify:	0
	Total Planned no. of hours (across entire course)	39

Estimated percentage of hours for online and in-person learning, based on the total estimated no. of learning activity hours (across the semester):

Percentage of hours of Online learning (Includes synchronous and asynchronous learning)	0
Percentage of hours of In-person learning	100

Assessment Structure

Assessment Components (includes both continuous and summative assessment)

No.	Component	ILO	Related PLO or Accreditation	Weightage	Team/Individual	Rubrics	Level of Understanding
1	Continuous Assessment (CA): Class Participation(Seminar participation)	ILO1 –5	Acquisition of knowledge, Critical Thinking, Creative Thinking, Problem Solving & Decision Making, Oral Communication	10	Individual	Holistic	Multistructural
2	Continuous Assessment (CA): Test/Quiz(In-class MCQ Assessments)	ILO2-3	Acquisition of knowledge, Critical Thinking, Problem Solving & Decision Making	20	Individual	Analytic	Multistructural
3	Continuous Assessment (CA): Test/Quiz(In-class Quizzes)	ILO2 –3	Acquisition of knowledge, Critical Thinking, Problem Solving & Decision Making	20	Individual	Analytic	Multistructural
4	Continuous Assessment (CA): Project(Team Project)	ILO2 –5	Acquisition of knowledge, Problem Solving & Decision Making, Teamwork & Interpersonal Skills, Oral Communication	50	Team	Analytic	Multistructural

Description of Assessment Components (if applicable)

1. Seminar participation (10%)
Seminar participation refers to both professional in-class behavior (in terms of attendance, punctuality and engagement) as well as voluntary individual contributions to discussions in seminars. . The former will constitute 20% and the latter 80% of the overall 10% marks allocated to seminar participation (see Appendix A). Individual contributions to discussions in seminars can take the form of an insightful question, comment, or response, and are assessed on both the quality and consistency of participation.

2. In-class MCQ Assessments (20%)
Students will be given multiple-choice-question (MCQ) assessment in-class to assess your grasp in the key fundamental concepts that are being taught.

3. In-class Quizzes (20%)
Individual open-book in-class quizzes will put to test the skills taught to you in the area of SQL and visualisation to ensure that the Learning Outcome(s) have been achieved. The responses to the in-class quiz should be submitted individually through NTULearn after the completion of the quiz.

4. Team Project (50%)
Each student will be assigned to a team comprising four to five members, where each team is expected to come up with prototype dashboard(s) to solve audit and/or accounting problem statements. More specific guidelines on the team project will be provided at the start of the course on the AB5103 NTULearn main site. Refer to the section on 'course policies and student responsibilities' for free-riding issues.

Formative Feedback

Feedback is central to this course.

In the process of conceptualization of the prototype solution(s), continuous feedbacks will be given as your progress on your team project to ensure that your final deliverable and presentation will meet the course requirements.

You will also have feedback on your in-class MCQ assessments and in-class quiz, which will test you on the technical skillsets taught in class (such as SQL).

NTU Graduate Attributes/Competency Mapping

This course intends to develop the following graduate attributes and competencies (maximum 5 most relevant)

Attributes/Competency	Level
Collaboration	Intermediate
Communication	Intermediate
Creative Thinking	Intermediate
Digital Fluency	Intermediate
Problem Solving	Intermediate

Course Policy

Policy (Academic Integrity)

Good academic work depends on honesty and ethical behaviour. The quality of your work as a student relies on adhering to the principles of academic integrity and to the NTU Honour Code, a set of values shared by the whole university community. Truth, Trust and Justice are at the core of NTU's shared values. As a student, it is important that you recognize your responsibilities in understanding and applying the principles of academic integrity in all the work you do at NTU. Not knowing what is involved in maintaining academic integrity does not excuse academic dishonesty. You need to actively equip yourself with strategies to avoid all forms of academic dishonesty, including plagiarism, academic fraud, collusion and cheating. If you are uncertain of the definitions of any of these terms, you should go to the academic integrity website for more information. On the use of technological tools (such as Generative AI tools), different courses / assignments have different intended learning outcomes. Students should refer to the specific assignment instructions on their use and requirements and/or consult your instructors on how you can use these tools to help your learning. Consult your instructor(s) if you need any clarification about the requirements of academic integrity in the course.

Policy (General)

You are expected to complete all assigned pre-class readings and activities, attend all seminar classes punctually and take all scheduled assignments by due dates. You are expected to take responsibility to follow up with course notes, assignments and course related announcements for seminar sessions you have missed. You are expected to participate in all seminar discussions and activities.

Policy (Absenteeism)

Absence from class without a valid reason will affect your overall course grade. Valid reasons include falling sick supported by a medical certificate and participation in NTU's approved activities supported by an excuse letter from the relevant bodies.
If you miss a seminar, you must inform the course instructor via email prior to the start of the class.

Policy (Others, if applicable)

Free-riding:
For the team project, members of each team are strongly encouraged to discuss and agree on each member's tasks and responsibilities early, and to amiably resolve any subsequent dispute(s) as a team prior to consulting their course instructor. Do flag out free-riding to the instructor and if the problem persists despite corrective intervention by team members and/or instructor, disciplinary repercussions may include grade penalty and/or other consequences correspond to the severity of the misbehaviour. Thus, the overall mark for a team member is subject to downward moderation based on the team's peer evaluation. For example, if a member's average rating does not exceed 3, 4 or 5 on a scale ranging from 1 to 10, the member will receive 30%, 50% or 80% of the overall mark awarded to team presentation respectively. A score exceeding 5 is commensurate with 100% of the overall mark awarded.

Each member should complete an online peer assessment via GradeWay within two days after the submission of the final report.

Academic Integrity:
Good academic work depends on honesty and ethical behaviour. The quality of your work as a student relies on adhering to the principles of academic integrity and to the NTU Honour Code, a set of values shared by the whole university community. Truth, Trust and Justice are at the core of NTU's shared values.
As a student, it is important that you recognize your responsibilities in understanding and applying the principles of academic integrity in all the work you do at NTU. Not knowing what is involved in maintaining academic integrity does not excuse academic dishonesty. You need to actively equip yourself with strategies to avoid all forms of academic dishonesty, including plagiarism, academic fraud, collusion and cheating. If you are uncertain of the definitions of any of these terms, you should go to the academic integrity website for more information. Consult your instructor(s) if you need any clarification about the requirements of academic integrity in the course.

Leveraging on Generative Artificial Intelligence (GAI) Tools:
NTU's position is that we should equip students with the knowledge and skills to use these AI technologies productively in an ethical and critical manner, and to help them sharpen their cognitive skills by synthesising ideas, performing in-depth analysis, and working creatively. Students are expected to continue to practise high standards of academic and professional honesty and integrity.

You may use GAI programs (e.g., ChatGPT) to help in your work such as to generate ideas and to improve your writing. However, you should be aware that the materials generated by GAI programs may contain inaccuracies and can be incomplete. Please be aware that the use of GAI may also stifle the development of your skills in writing as well creative and critical thinking. Please note that contributions from GAI programs must be properly quoted and cited every time they are used. An example of how to cite for the use of generative AI is in this link: https://apastyle.apa.org/blog/how-to-cite-chatgpt.

Failure to do so is consider a violation of academic integrity.

NTU2025 Education Initiatives

In this course, the following NTU2025 education initiatives are emphasised:

No.	Initiative	Description	Select
1	Interdisciplinary learning	Students learn through **applying more than one disciplinary framework** to solve problems or examine issues from different perspectives.	☐
2	Collaborative learning	Students learn through **sharing and working with one another** to solve problems or address issues.	☐
3	Experiential learning	Students learn through activities that have significant elements of **observation and reflection** of **concrete experience.**	☐

External Partner

Indicate the organisation's name(s) and describe the nature of involvement e.g., co-curation of course, speaker or instructor (include no. of course hours if known).

No.	Organization Type	Organisation Name	Nature of involvement

Appendix with Rubric (Assessment Criteria)

Please remember to attach the Appendix with Rubric (Assessment Criteria) if you have uploaded any.
https://entuedu-my.sharepoint.com/:w:/r/personal/graceyang_staff_main_ntu_edu_sg/Documents/1.%20ECL_SMS%20School%20Course%20Details/3.%20NTU%20-%20Undergrad%20Education%20(UG)/COB/NBS/ACC/Shared_COB_NBS_ACC/Working%20Files%20(Can%20Access)/1.%20Course%20Outlines/Active%20courses%20alread=w5dd423273f5941e49205cc1d068f1f81&csf=1&web=1&e=cYvgvn

Last Updated Date: 18-07-2024 01:31:59

Last Updated By: Koh Li Min Felicia

Please refer to the next page for the current status of approval as captured by the Curriculum Management Application.

Progress of Approval Path

This version of the course details, submitted with the Cover Page AB5103_OAS Cover Page with Annex A (Course Outline)_14 May 2024.docx, has been approved at the levels of:

Approval Level	Triggered By	Approved Date & Time
NBS Admin - ASU	Wendy Tan Kim Suan	14-05-2024 08:31:16
NBS - ADMO	Pua Szu Chi Madeline	03-06-2024 00:08:44
Head of Division	Premila Gowri Shankar	03-06-2024 06:26:19
NBS Admin - UG CPO	Nicholas Wan Wei Siang	18-06-2024 14:45:18
Associate Dean (Undergraduate), CoB	Damien Joseph (Assoc Prof)	18-06-2024 15:25:56
Associate Provost (Undergraduate Education) or delegate, via MiCCA	Koh Li Min Felicia	18-07-2024 01:31:59

Final Approval Status

The approval process has been completed on 18-07-2024 01:31:59, based on the Approval Path shown above.

Note: If no Approval Path is shown above, the Course has been approved through offline means (e.g. routing by emails). Please access the course in the Curriculum Management Application and refer to its Attachment tab for the necessary approval documents/ communication.