



ITEC832

Enterprise Application Integration

S1 Evening 2015

Dept of Computing

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Disclaimer

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General Information

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| Unit convenor and teaching staff Ian Krycer ian.krycer@mq.edu.au |
| Credit points 4 |
| Prerequisites ISYS301 |
| Corequisites |
| Co-badged status |
| Unit description This unit focuses on integration technologies from internal application integration to external business-to-business integration. Integration activities start with a process model and process redesign targets. We use the market leading IBM BlueWorks Live software to define our processes. Application integration techniques such as data orientated, application interfaces, message orientated middleware and application servers are covered. The role of Web APIs and RESTful architecture is considered, as well cloud based infrastructure, platforms and SaaS. We then consider B2B integration with EDI and Web Services, and the role of portals. We explore the objectives of business process management and supply chain planning and consider a recent innovative government integration initiative as a student presented case study. |

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

Learning Outcomes

On successful completion of this unit, you will be able to:

Apply an understanding of process modelling to analyse an existing 'As Is' process and be able to compare and contrast with proposed improved 'To Be' processes.

Critically evaluate application integration technologies such as APIs, database integration, application servers and business process management systems and recommend the most suitable technology for the situation.

Apply an understanding of the subtle differences between a Web Services based Service

Orientated Architecture and a REST based Web Orientated Architecture to plan an IT integration project.

Discuss and critically evaluate the available B2B integration technologies and determine the potential business benefits and the required commensurate enterprise architecture to achieve process improvement goals.

Confidence in leadership skills; communication skills; critical analysis skills; problem-solving skills and creative thinking skills.

Assessment Tasks

| Name | Weighting | Due |
|------------------------------------------|-----------|------------|
| <u>Assignment 1</u> | 15% | 18/03/2015 |
| <u>Assignment 2</u> | 10% | 1/04/2015 |
| <u>Assignment 3</u> | 25% | 27/05/2015 |
| <u>Final Examination</u> | 50% | TBA |

Assignment 1

Due: **18/03/2015**

Weighting: **15%**

You are given an actual hospital procurement process. This is to be modeled as the 'As Is' Process using IBM Blue Works Live SaaS software. Metrics such as process cost and time are to be derived. Based on the objectives of business process reengineering, an automated, improved 'To Be' process is to be proposed. The new process is to be assessment according to the modeling metrics as well as a SWOT analysis and ROI justification.

On successful completion you will be able to:

- Apply an understanding of process modelling to analyse an existing 'As Is' process and be able to compare and contrast with proposed improved 'To Be' processes.
- Critically evaluate application integration technologies such as APIs, database integration, application servers and business process management systems and recommend the most suitable technology for the situation.
- Apply an understanding of the subtle differences between a Web Services based Service Orientated Architecture and a REST based Web Orientated Architecture to plan an IT integration project.

- Discuss and critically evaluate the available B2B integration technologies and determine the potential business benefits and the required commensurate enterprise architecture to achieve process improvement goals.
- Confidence in leadership skills; communication skills; critical analysis skills; problem-solving skills and creative thinking skills.

Assignment 2

Due: **1/04/2015**

Weighting: **10%**

You are given a well researched case study about the introduction of electronic medical records in the US. The case highlights the technological, management and organizational challenges of this immense application integration undertaking. Students are required to answer questions about the case study and provide As Is and To Be process models for one of the system's components.

On successful completion you will be able to:

- Apply an understanding of process modelling to analyse an existing 'As Is' process and be able to compare and contrast with proposed improved 'To Be' processes.
- Critically evaluate application integration technologies such as APIs, database integration, application servers and business process management systems and recommend the most suitable technology for the situation.
- Apply an understanding of the subtle differences between a Web Services based Service Orientated Architecture and a REST based Web Orientated Architecture to plan an IT integration project.
- Discuss and critically evaluate the available B2B integration technologies and determine the potential business benefits and the required commensurate enterprise architecture to achieve process improvement goals.
- Confidence in leadership skills; communication skills; critical analysis skills; problem-solving skills and creative thinking skills.

Assignment 3

Due: **27/05/2015**

Weighting: **25%**

Students form groups of 4 and choose a contemporary SaaS implementation case study from a given list of published recent studies. The team is to reverse engineer a possible inefficient As Is Process and identify the opportunities for improvement. Then, model the given new To Be Process as described in the case study and demonstrate how it delivers significant business benefits and the metrics to manage and quantify the benefits. The team is to submit a structured

report comprised of each member's contribution and then each member is to give a class presentation on their findings.

On successful completion you will be able to:

- Apply an understanding of process modelling to analyse an existing 'As Is' process and be able to compare and contrast with proposed improved 'To Be' processes.
- Critically evaluate application integration technologies such as APIs, database integration, application servers and business process management systems and recommend the most suitable technology for the situation.
- Apply an understanding of the subtle differences between a Web Services based Service Orientated Architecture and a REST based Web Orientated Architecture to plan an IT integration project.
- Discuss and critically evaluate the available B2B integration technologies and determine the potential business benefits and the required commensurate enterprise architecture to achieve process improvement goals.
- Confidence in leadership skills; communication skills; critical analysis skills; problem-solving skills and creative thinking skills.

Final Examination

Due: **TBA**

Weighting: **50%**

A compulsory closed book exam covering all lecture, reference and workshop material.

On successful completion you will be able to:

- Apply an understanding of process modelling to analyse an existing 'As Is' process and be able to compare and contrast with proposed improved 'To Be' processes.
- Critically evaluate application integration technologies such as APIs, database integration, application servers and business process management systems and recommend the most suitable technology for the situation.
- Apply an understanding of the subtle differences between a Web Services based Service Orientated Architecture and a REST based Web Orientated Architecture to plan an IT integration project.
- Discuss and critically evaluate the available B2B integration technologies and determine the potential business benefits and the required commensurate enterprise architecture to achieve process improvement goals.
- Confidence in leadership skills; communication skills; critical analysis skills; problem-

solving skills and creative thinking skills.

Delivery and Resources

Each week you should attend up to 4 hours of lectures and tutorials. For details of days, times and rooms consult the [timetables webpage](#).

Please note that you will be **required** to attend 80% of the lectures and hand in prepared work as required. Failure to do so may result in you failing the unit or being excluded from the exam.

Recommended Texts

The references for this unit are constantly being updated and textbooks do not keep up with the changes in technology. Hence, there is no mandatory textbook for this unit. The following texts are recommended reading:

Douglas K. Barry (2013) Web Services, Service-Orientated Architectures and Cloud Computing, 2e, Morgan Kaufmann, Sydney

David S. Linthicum (2009) Cloud Computing and SOA Convergence in Your Enterprise: A Step-by-Step Guide, Addison Wesley, Sydney

Lecture handouts will list appropriate Web based references and further reading for some of the rapidly evolving technologies discussed in this course. All the lecture handouts and soft copy references will be available for download from the class Web site from Week 1 at: <https://ilearn.mq.edu.au/>

We are using IBM Blue Works Live for process modeling. This is a SaaS app that initially has a free 30 day trial period. We then apply for an educational licence and can use the collaborative features for Assignment Two. We use the latest BPMN 2.0 modelling notation.

Other technology required is MS Word, MS Visio and MS PowerPoint.

Submission methods for assessment tasks:

All assignment submissions are soft copy, and return of marks and comments, will be done through the ITEC832 page on iLearn.

Late submission:

Late submission of individual work will incur a 10% penalty for every 24 hours, or part thereof, it is late. So within 24 hours, the maximum mark that can be obtained is 90% of the full grade for that assessment task; between 24 and 48 hours, the maximum mark that can be obtained is 80% of the full grade; and so on. No extra documentation is required unless the student does wish to have an extension (see below) applied.

Late submissions of group based assignments are not permitted unless under exceptional circumstances with documentary evidence provided to the unit convenor which may include medical certificates as per the Department of Computing policy. One person being sick does not mean the group cannot submit work. Students are recommended to have a backup plan for group based submissions.

Extensions:

Extensions without a grade penalty may be provided to individuals who contact student services BEFORE the due date and can provide documentary evidence of illness or other misadventure and succeed in gaining a certified disruption. (Health issues will require a university issued Professional Authority Form.). If approved, a new submission timeline and submission method will be discussed on a case by case basis.

Students are strongly advised to contact the unit convenor as early as possible if there are any issues that will not make an on-time submission possible.

Exam:

The final exam will focus on content covered in the classes throughout the semester. Please see the assessments section for details on the final exam.

Website and access to unit material:

The web page and content for this unit can be found at iLearn: <https://ilearn.mq.edu.au/login/MQ/>. Note that the unit content is not publicly available and requires for you to log in to access.

Unit Schedule

| Week | Topic | References |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| 1 | B2B E-Commerce Objectives Lean Methodology Practical – IBM Blue Works Live Tutorial | Turban, Electronic Commerce, 2012 Mark Robinson, 2014 IBM Training |
| 2 | BPMN 2.0 BPM Using Blue Works Live E-Procurement Processes Release Assignment One (Individual Assignment) | BPMN.ORG IBM Training IBM, Gartner and JDA |
| 3 | Collaborative Commerce (ERP II) B2B Data Integration (EDI and EDI-INT) Release Assignment Three (Group Assignment) 'Hospital Supply Chain Management' | Gartner Coles Group Specifications Salient Retail Link, 2012 |

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| 4 | <p>Introduction to Application Integration</p> <p>Web Services</p> <p>Services Orientated Architecture Assignment One Due Release Assignment Two (Individual Assignment)</p> | Roshen, 2008 Barry, 2013 |
| 5 | <p>SOA Case Study</p> <p>Data Orientated Application Integration</p> <p>Tutorial: Minor Project 1</p> | Barry, 2013 White, 2005 and 2009 Gartner, 2014 |
| 6 | <p>Application Integration - Application Interfaces - Application Servers</p> <p>Assignment Two Due</p> <p>Tutorial: Minor Project 2</p> | Faber Novel, 2012 IBM, 2009 Gartner, 2012 |
| 7 | <p>Cloud Computing</p> <p>Processes in the Cloud</p> <p>Tutorial: Minor Project 3</p> | Linthicum, 2009 |
| 8 | <p>Enterprise Systems Integration, Oracle Fusion (Guest Speaker)</p> <p>B2B Integration (Procure to Pay Process)</p> <p>Tutorial: Minor Project 4</p> | Tanya Williams, 2015 Ariba, 2014 |
| 9 | <p>BPM and SOA Together</p> <p>OmniChannel Marketing</p> <p>Tutorial: Minor Project 5</p> | Skalle and Hahn, 2013 JDA, 2012; Wipro, 2014 |
| 10 | <p>Business Process Management Systems</p> <p>Internet of Things</p> <p>Tutorial: Minor Project 6</p> | Gartner, 2014 BI Intelligence, 2015 |
| 11 | Tutorial – Group Assignment | |
| 12 | <p>Group Presentations</p> <p>Assignment Three Due</p> | |

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|----|-------------------------------|
| 13 | Group Presentations continued |
| | Tutorial and Revision |

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#). Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy http://mq.edu.au/policy/docs/academic_honesty/policy.html

Assessment Policy <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy <http://mq.edu.au/policy/docs/grading/policy.html>

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Grievance Management Policy http://mq.edu.au/policy/docs/grievance_management/policy.html

Disruption to Studies Policy http://www.mq.edu.au/policy/docs/disruption_studies/policy.html *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of Policy Central.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/support/student_conduct/

Results

Results shown in *iLearn*, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit ask.mq.edu.au.

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

IT Help

For help with University computer systems and technology, visit <http://informatics.mq.edu.au/help/>.

When using the University's IT, you must adhere to the [Acceptable Use Policy](#). The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

PG - Capable of Professional and Personal Judgment and Initiative

Our postgraduates will demonstrate a high standard of discernment and common sense in their professional and personal judgment. They will have the ability to make informed choices and decisions that reflect both the nature of their professional work and their personal perspectives.

This graduate capability is supported by:

Learning outcomes

- Apply an understanding of process modelling to analyse an existing 'As Is' process and be able to compare and contrast with proposed improved 'To Be' processes.
- Critically evaluate application integration technologies such as APIs, database integration, application servers and business process management systems and recommend the most suitable technology for the situation.
- Apply an understanding of the subtle differences between a Web Services based Service Orientated Architecture and a REST based Web Orientated Architecture to plan an IT integration project.
- Discuss and critically evaluate the available B2B integration technologies and determine the potential business benefits and the required commensurate enterprise architecture to achieve process improvement goals.
- Confidence in leadership skills; communication skills; critical analysis skills; problem-solving skills and creative thinking skills.

Assessment tasks

- Assignment 1

- Assignment 2
- Assignment 3
- Final Examination

PG - Discipline Knowledge and Skills

Our postgraduates will be able to demonstrate a significantly enhanced depth and breadth of knowledge, scholarly understanding, and specific subject content knowledge in their chosen fields.

This graduate capability is supported by:

Learning outcomes

- Apply an understanding of process modelling to analyse an existing 'As Is' process and be able to compare and contrast with proposed improved 'To Be' processes.
- Critically evaluate application integration technologies such as APIs, database integration, application servers and business process management systems and recommend the most suitable technology for the situation.
- Apply an understanding of the subtle differences between a Web Services based Service Orientated Architecture and a REST based Web Orientated Architecture to plan an IT integration project.
- Discuss and critically evaluate the available B2B integration technologies and determine the potential business benefits and the required commensurate enterprise architecture to achieve process improvement goals.

Assessment tasks

- Assignment 1
- Assignment 2
- Assignment 3
- Final Examination

PG - Critical, Analytical and Integrative Thinking

Our postgraduates will be capable of utilising and reflecting on prior knowledge and experience, of applying higher level critical thinking skills, and of integrating and synthesising learning and knowledge from a range of sources and environments. A characteristic of this form of thinking is the generation of new, professionally oriented knowledge through personal or group-based critique of practice and theory.

This graduate capability is supported by:

Learning outcomes

- Apply an understanding of process modelling to analyse an existing 'As Is' process and

be able to compare and contrast with proposed improved 'To Be' processes.

- Critically evaluate application integration technologies such as APIs, database integration, application servers and business process management systems and recommend the most suitable technology for the situation.
- Apply an understanding of the subtle differences between a Web Services based Service Orientated Architecture and a REST based Web Orientated Architecture to plan an IT integration project.
- Discuss and critically evaluate the available B2B integration technologies and determine the potential business benefits and the required commensurate enterprise architecture to achieve process improvement goals.

Assessment tasks

- Assignment 1
- Assignment 2
- Assignment 3
- Final Examination

PG - Research and Problem Solving Capability

Our postgraduates will be capable of systematic enquiry; able to use research skills to create new knowledge that can be applied to real world issues, or contribute to a field of study or practice to enhance society. They will be capable of creative questioning, problem finding and problem solving.

This graduate capability is supported by:

Learning outcomes

- Apply an understanding of process modelling to analyse an existing 'As Is' process and be able to compare and contrast with proposed improved 'To Be' processes.
- Critically evaluate application integration technologies such as APIs, database integration, application servers and business process management systems and recommend the most suitable technology for the situation.
- Apply an understanding of the subtle differences between a Web Services based Service Orientated Architecture and a REST based Web Orientated Architecture to plan an IT integration project.
- Discuss and critically evaluate the available B2B integration technologies and determine the potential business benefits and the required commensurate enterprise architecture to achieve process improvement goals.

Assessment tasks

- Assignment 1
- Assignment 2
- Assignment 3
- Final Examination

PG - Effective Communication

Our postgraduates will be able to communicate effectively and convey their views to different social, cultural, and professional audiences. They will be able to use a variety of technologically supported media to communicate with empathy using a range of written, spoken or visual formats.

This graduate capability is supported by:

Learning outcomes

- Apply an understanding of process modelling to analyse an existing 'As Is' process and be able to compare and contrast with proposed improved 'To Be' processes.
- Critically evaluate application integration technologies such as APIs, database integration, application servers and business process management systems and recommend the most suitable technology for the situation.
- Apply an understanding of the subtle differences between a Web Services based Service Orientated Architecture and a REST based Web Orientated Architecture to plan an IT integration project.
- Discuss and critically evaluate the available B2B integration technologies and determine the potential business benefits and the required commensurate enterprise architecture to achieve process improvement goals.
- Confidence in leadership skills; communication skills; critical analysis skills; problem-solving skills and creative thinking skills.

Assessment tasks

- Assignment 1
- Assignment 2
- Assignment 3
- Final Examination

PG - Engaged and Responsible, Active and Ethical Citizens

Our postgraduates will be ethically aware and capable of confident transformative action in relation to their professional responsibilities and the wider community. They will have a sense of connectedness with others and country and have a sense of mutual obligation. They will be able

to appreciate the impact of their professional roles for social justice and inclusion related to national and global issues

This graduate capability is supported by:

Learning outcomes

- Apply an understanding of the subtle differences between a Web Services based Service Orientated Architecture and a REST based Web Orientated Architecture to plan an IT integration project.
- Discuss and critically evaluate the available B2B integration technologies and determine the potential business benefits and the required commensurate enterprise architecture to achieve process improvement goals.
- Confidence in leadership skills; communication skills; critical analysis skills; problem-solving skills and creative thinking skills.

Assessment task

- Assignment 3

Changes from Previous Offering

- Lectures have been updated with the latest technology using recent analyst reports.
- Assignments 1 and 3 have been updated with Blue Works Live and the latest BPMN 2.0 modelling notation.
- Assignment 3 has been redesigned around more interesting recent SaaS case studies, rather than a uniform case study for all groups.

Standards

Four standards, namely HD, D, CR, P summarize as many different levels of achievement. Each standard is precisely defined to help students know what kind of performance is expected to deserve a certain mark. The standards corresponding to the learning outcomes of this unit are given below:

| | | | |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| HD | Apply techniques and knowledge in new contexts, show breadth and depth of understanding of business process modeling and its role in justifying investment in application integration technologies. | A sound grounding in designing application integration architectures, understanding the web services evolution to a Services Orientated Architecture and the role of Business Process Management. | Demonstrate leadership, creativity, critical thinking and analysis skills. Enthusiatic in acquiring new knowledge in the application integration area. Demonstrate capability in applying new application integration knowledge to solve real-world problems. Conduct team work effectively and play a key role in moving the whole project team forward. |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| | | | |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| D | Apply techniques and knowledge in some new contexts, show breadth and depth of understanding of across most of the business process modeling topics and its role in justifying investment in application integration technologies. | Apply techniques and knowledge in some new contexts, show breadth and depth of understanding across most of the topics: designing application integration architectures, understanding the web services evolution to a Services Orientated Architecture and the role of Business Process Management. | Demonstrate some leadership occasionally. Show creativity, critical thinking and analysis skills. Have the capability in applying application integration knowledge to solve real-world problems. Collaborate with team members well and finish assigned tasks on time and with good quality. |
| CR | Show breadth of understanding across most of the business process modeling topics and its role in justifying investment in application integration technologies. | Show breadth of understanding across most of designing application integration architectures, understanding the web services evolution to a Services Orientated Architecture and the role of Business Process Management. | Demonstrate analysis skills in some occasions. Know how to apply application integration to solve some of the real-world problems. Able to finish assigned tasks on time and with good quality most of the time. |
| P | Can reproduce definitions and ideas, show some breadth of understanding othe business process modeling topics and its role in justifying investment in application integration technologies. | Can reproduce some defintions and ideas, show some breadth on issues in how breadth of understanding across most of designing application integration architectures, understanding the web services evolution to a Services Orientated Architecture and the role of Business Process Management. | Demonstrate limited analysis skills. Can apply application integration knowledge to solve limited real-world problems. Able to finish all assigned tasks on time and with acceptable quality. |

Grading

At the end of the semester, you will receive a grade that reflects your achievement in the unit

- **Fail (F):** does not provide evidence of attainment of all learning outcomes. There is missing or partial or superficial or faulty understanding and application of the fundamental concepts in the field of study; and incomplete, confusing or lacking communication of ideas in ways that give little attention to the conventions of the discipline.
- **Pass (P):** provides sufficient evidence of the achievement of learning outcomes. There is demonstration of understanding and application of fundamental concepts of the field of study; and communication of information and ideas adequately in terms of the conventions of the discipline. The learning attainment is considered satisfactory or adequate or competent or capable in relation to the specified outcomes.
- **Credit (Cr):** provides evidence of learning that goes beyond replication of content knowledge or skills relevant to the learning outcomes. There is demonstration of substantial understanding of fundamental concepts in the field of study and the ability to apply these concepts in a variety of contexts; plus communication of ideas fluently and clearly in terms of the conventions of the discipline.
- **Distinction (D):** provides evidence of integration and evaluation of critical ideas, principles and theories, distinctive insight and ability in applying relevant skills and concepts in relation to learning outcomes. There is demonstration of frequent originality

in defining and analysing issues or problems and providing solutions; and the use of means of communication appropriate to the discipline and the audience.

- **High Distinction (HD):** provides consistent evidence of deep and critical understanding in relation to the learning outcomes. There is substantial originality and insight in identifying, generating and communicating competing arguments, perspectives or problem solving approaches; critical evaluation of problems, their solutions and their implications; creativity in application.

In this unit, your final grade depends on your performance in each part of the assessment. For each task, you receive a mark that combines your standard of performance regarding each learning outcome assessed by this task. Then the different component marks are added up to determine your total mark out of 100. Your grade then depends on this total mark and your overall standards of performance.

In particular, in order to pass the unit, you must

- Have performed satisfactorily in the internal (assessment) components of the course.
- Have satisfactory performance in the final examination.

This means that you may fail the unit if you do not submit satisfactory submissions for the assignments OR do not perform satisfactorily in the exam.

Department of Computing expectations are that students have to perform satisfactorily in the final exam as well as in their internal work/assignments.

Obtaining a grade higher than a Pass (P) in this unit will require a student to obtain (in addition to the above):

- the required total number of marks (Credit - 65, Distinction - 75, High Distinction - 85).