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CERTIFICATION COURSE FOR GREEN MARK MANAGER



Outline of Presentation:

- **Introduction to Course & Training Outcomes**
- **Course Assessments**
  - Purpose of assessments
  - Forms of assessments
  - Conditions for Award of Certificates
- **Other Green Programmes by BCA Academy**

By : Lecturer / Ms Tai Yoke Ying

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BCA GREEN MARK MANAGER (GMM)

- A training and certification scheme
- The goal is to build a core of Green Specialists in support of BCA Green Mark for Buildings Scheme
- The scheme envisioned a **Certified GMM** as:

  "A Certified GMM is a professional or technical person who possesses the requisite knowledge and skills that would enable him to contribute effectively to the design and certification of Green Mark Buildings."

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Training Outcomes:

- Familiar with GM for Buildings Scheme, legislation and submission requirements
- Understand green building practices, principles and technologies
- Explore innovative green solutions and conduct Cost-benefit Analysis of options
- Ability to facilitate an Integrated Green Design Project
- Manage a GM Project Implementation



* Likely to be an architect, mechanical, electrical,civil engineer, QS, project or facility manager.

CERTIFICATION COURSE FOR GREEN MARK MANAGER

Time-table

Day 1 to Day 4: (lectures)	9:00 am to 5:30 pm
Day 5: (assessments)	8:45 to 9:45am, 1-hour Quiz 10:00 to 1:00pm, Group Work Presentation

ASSESSMENT MECHANISM

- **Purpose of Assessments**

  To gauge a candidate's competency in the effective management of a Green Mark project, his level of understanding in the criteria & requirements, process, and technology.

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- **Summary (Assessments)**

Trainees who meet the minimum **75%** class attendance will be eligible to take the end-of-course assessments, which comprises of:

Form of assessment	Passing Mark	When
a) 1-hour Quiz (40 MCQs)	60 out of 100	**Held on day 5 of course, which is about two weeks after the lectures**
b) Team Project (20 mins Presentation)	50 out of 100	
c) Team Project (Peer Assessment)	12.5 out of 25 pts	**To be submitted during the final project presentation**

ASSESSMENT 1: QUIZ

- Duration: 1 hour
  40 MCQs, 2.5 marks each

The exam will cover the contents of the entire course. It is a **open book exam**. Each paper is formed based on the below test plan.

TEST PLAN - Topics	Lecture Hrs	Questions Set
BCA's Green Building Initiatives & Regulatory Framework	1	2
Green Mark for Non-residential buildings, Residential buildings, and Existing buildings ***	3	5
Efficient Building Envelope	2	3
Photovoltaic (PV) Technology	3	4
Natural Ventilation & Passive Cooling of Buildings	2	3
Computer Simulations	2	3
Green Costing & LCC	2	3
Efficient Air-conditioning & Heat Recovery ***	5	5
Eco-lighting in buildings	3	4
Sustainable Construction & Recycled Materials	1	2
Water Conservation & Strategies to Water Efficiency **	1	2
Green Roofing & Indoor Air Quality	3	4
		40

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ASSESSMENT 1: QUIZ

Things to Note for MCQ test:

1) **Bring a calculator**
2) **Bring your identification card (E.g. IC, Employment Pass etc)**
3) **Mobile phones & electronic devices (E.g. iPad, smartphones etc) are not allowed during MCQ test**
4) **Open book test – please bring your notes**

ASSESSMENT 2: TEAM PROJECT

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▪ Requirements

Trainees are organised into teams of between 6 to 8 peoples, with members from different background and disciplines. The aim is to learn to collaborate with co-disciplines to attain the environmental design targets as in a real-life design development. Teams are required to conduct a Green Mark's assessment, redesign and reassess the energy and environmental performance of a large-scale commercial building.

Teams will be assigned to work on one of the following specific areas:

Team 1	Building Simulations (Optional)
Team 2	Air-Conditioning System
Team 3	Light System
Team 4	Greenery & Water Conservation
Team 5	Façade System
Team 6	Recycle Material & Sustainable Const.

ASSESSMENT 2: TEAM PROJECT

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▪ Final Submission

Consists of a 20 minutes oral presentation to a panel of 3 assessors. Three members from each team will be picked to present their findings and recommendations to the panel.

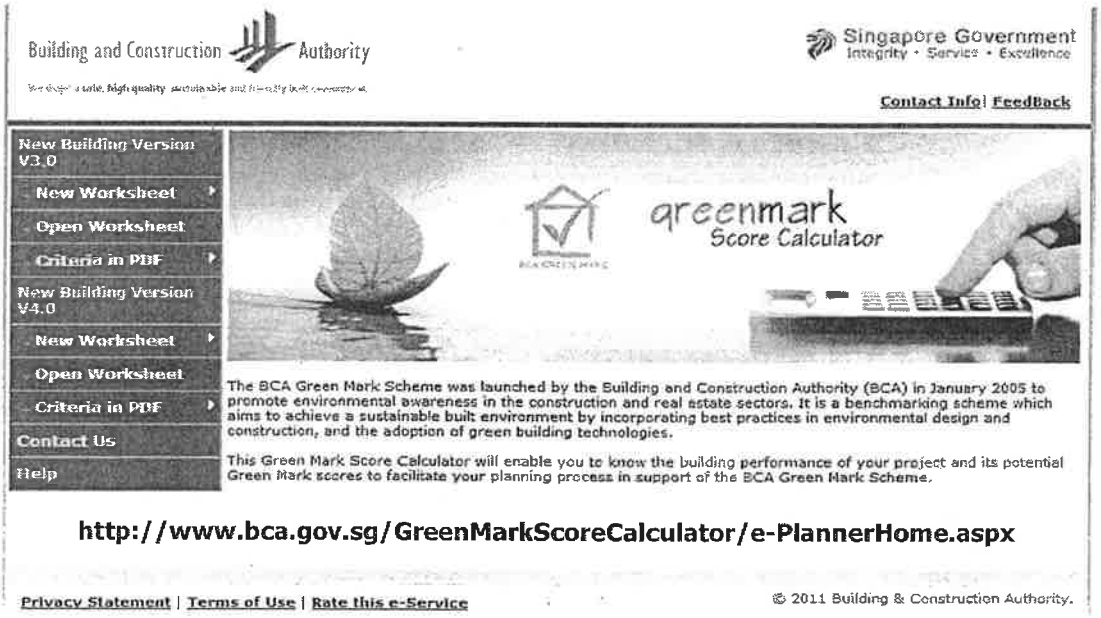
▪ Assessment Criteria

Criteria	Weightage	Score
Presentation	15%	
Specific Areas (comprehensive)	15%	
Solutions (feasible and ease of implementing)	20%	
Long-term Energy Savings and ROI	20%	
Investment (low cost to implement & owner's willingness to invest)	20%	
Impact to Environment (reduction of CO_2 and social benefits	10%	

▪ Who are in the Assessment Panel

- A/P Lee Siew Eang (Director of ESU/NUS), Mr Jeffery Neng (Dy Dir GMD-ND/BCA), Mr Toh Eng Shyan (Dy Dir GMD-EB/BCA), Mr Vincent Low (Director of G-Energy), Mr Eugene Seah (Exec Director/DLS)

ASSESSMENT 2: TEAM PROJECT – Project Presentation



It is <u>compulsory</u> for the GMM's project teams to print (3 copies) and submit the Green Mark score in PDF format as part of the GM project presentation requirement.

TEAM PROJECT: PEER EVALUATION

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▪ Submission

Trainees are required to submit the peer evaluation form to Course Co-ordinator in a seal envelope. Submission of the form is **Compulsory**.

Trainees are required to rate each of their team members, excluding themselves, on each of the criteria listed below as objectively as possible. For each criteria, assigned a score of (1 to 5), from <u>very little/very infrequently</u> to <u>very much/all the time</u>.

Team Members	Trainee 1	Trainee 2 ...
1. Frequency of attendance at group meeting		
2. Contribution in terms of ideas		
3. Contribution in researching the project		
4. Contribution in providing/finding and evaluating data		
5. Taking care of proof reading & preparing of the presentation slides		
Total – Overall contribution to group project		

Note - Trainee needs to achieve a minimum score of **12.5 out of 25 points** for satisfactory performance

Upgrading **Course** for GREEN MARK MANAGERS

GREEN MARK Professional (GMP) Scheme

- **A certified GMP is envisioned as:**

  "A competent professional* who possesses the knowledge and skills capable of carrying out detailed design, prediction and enhancement of building performance for Green Mark certification and implementation"

- **Competencies**

  Apart from GMM's roles, plus

  - **Perform detailed analysis and prediction of building performance using solar and energy modeling software**
  - **Appraise, recommend and design high impact systems** e.g facades with advanced daylighting devices and/or PV cells, heat recovery, thermal storage, district cooling systems, pneumatic waste system etc
  - **Facilitate an integrated design for GM Gold^{plus} or Platinum certification**

- **Recognition**

  Projects manage/facilitate by GMM(s) are eligible to earn 0.5 point towards GM certification

* Is a mechanical engineer, electrical engineer, or any competent building professionals

Green Mark Professional Course & Structure

- **Aims to provide "holistic" skillsets in Sustainable Development**
- **Covers current GBT knowledge - concepts and applications inclusive Simulation tools**
- **For the Award of "Certificate of Successful Completion" , applicants need to complete 6 Core modules and any 3 Elective modules with 3 years**
- **Estimated duration 23 to 25 days. For flexibility, modules offer as a series of short Continuous Professional Development (CPD) Courses**
- **SGM will seek accreditation for CPDs and PDUs.**

Table – GMP modules and duration

	Core Modules		Elective Modules (Select any 3)
1	4-1/2 day Certification Course for Green Mark Manager	7	1-day Course on Maximize Green Design through Building Automation
2	3-day Course on Solar Modeling	8	2-day Course on IAQ Solutions for Sustainable Buildings
3	4-day Course on Thermal & Energy Modeling	9	2-day Course on Energy Efficiency & Efficient Drives
4	4-day Course on Energy Management & Audit	10	2-day Course on Efficient Eco-lighting Design for Buildings
5	3-day Course on Energy Efficient Air-Conditioning for Buildings	11	1-day Course on Green Architecture & the Integrated Design Process
6	2-day Course on Efficicent Building Envelope, ETTV & RETV	12	3-day Course on Passive Design for Natural Ventilation
		13	1-day Course on Integrating Greenery for Higher Building Performance*
	Total : - **About 25.5 days**	14	3- day Course on CFD Modeling for Green Building Design*

Certification Course for Green Mark Facilities Manager

- **Learning Outcomes**
- An in-depth understanding of the **Green Mark Criteria** for **Existing Buildings** (version 2.1) and **Office Interior** including baselines, scores and certification process
- Adopting **life-cycle cost approach** in budgeting and procurement
- Ability to implement **practical strategies and solutions** to maximise energy, water, indoor environment quality, and waste reduction
- Familiarise with current **sustainable practices** in refurbishment, green procurement, and leasing
- Ability to **facilitate and manage** existing buildings for Green Mark certification

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Course Outline

S/no	Topics	Training hours
1	Green Mark Criteria for Existing Building and Office Interior	3
2	Life-Cycle Cost Analysis in Budgeting and Procurement	3
3	Green Strategies for Operation and Maintenance of Building Energy Systems	9
4	Energy Audit and Analysis	6
5	Water Management & Landscape Irrigation	3+2
6	Waste Management, Recycling and Reduction	1
7	Improvements to Indoor Air Quality	3
8	Ecological Building Materials & Green Procurement	3
9	Commissioning Process for Existing Buildings	3
10	Sustainable Refurbishment Process & Green Leasing Practices - Case study	3
11	Assessment Tests	3
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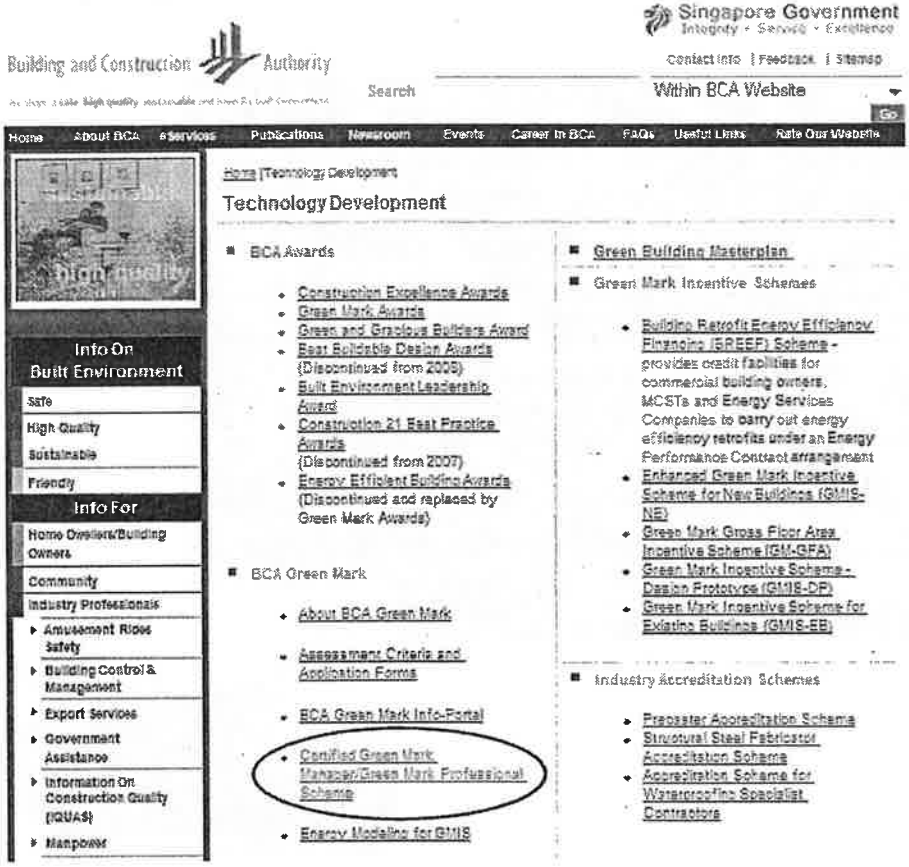
http://www.bca.gov.sg/Professionals/Technology/technology.html

Certified GMM / GMP / GMFM



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http://www.bca.gov.sg/GreenMark/gm_manager.html

Refresher Training

To ensure that the Certified professionals remains relevant and up-to-date with the latest Green Mark criteria and requirements, Certified GMM / GMP/ GMFM have to undergo a half-day refresher training every 2 years from the date of being certified. Please note that the onus is on the Certified GMM/ GMP/ GMFM to sign up for these refresher courses within 2 years of being certified, failing which the Certification will lapse and you would need to reapply for accreditation again. Hence, it is compulsory to attend refresher training to claim Green Mark points for projects. A Certificate of Attendance will be issued upon completion of the refresher course.

Frequently Asked Questions

You are advised to read through the FAQ for further details on the Certification conditions. Click here to view the FAQ.

List of Current Certified GMP / GMM / GMFM

Click here for the latest list of Certified GMP
Click here for the latest list of Certified GMM
Click here for the latest list of Certified GMFM

Application Form **this is not for course enrolment*

Click here to download the Application Form for Certified GMM / GMP / GMFM.

Contacts

General Enquiries on Certified GMM/ GMP/ GMFM application:
Certified GMM/GMP: Ms Annie Tan at 63255198 or email to annie_tan@bca.gov.sg
Certified GMFM: Ms Rohana Haron at 63255083 or email to rohana_haron@bca.gov.sg

For Enquiry on Courses and Enrolment: :

Ms Jenny Tan at 62489828 or email to jenny_tan@bca.gov.sg
Please call BCA Academy at 62489999 or email to bca_academy@bca.gov.sg

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Last Updated On 13 Jul 2012

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ROLES & CRITERIA FOR RECOGNITION

CRITERIA	CERTIFIED GMM (0.5 GM Point)	CERTIFIED GMP (1 GM Point)	CERTIFIED GMFM (0.5 GM Point)
Specific Role	To provide the design team with **technical advice** on built environment sustainability practices, environmental design, and Green Mark assessment on new construction and major renovations of existing buildings	To provide the design team with **expert advice** on built environment sustainability practices, environmental design, and Green Mark assessment of buildings **to achieve higher tier rating**	To ensure that the building **continues to operate to meet new green standards and energy efficiency, reduce emissions, and improve occupant well-being**
Entry requirements	Applicants should possess a building engineering or a building-related degree which is recognised locally with at least 3 years of relevant experience or 5 years for diploma holders	Applicants should possess a building engineering or a building-related degree which is recognised locally with at least 5 years of relevant experience.	Applicants should possess a building engineering or a building-related degree which is recognised locally with at least 3 years of relevant experience or 5 years for diploma holders.
Attended and passed the course	Certification Course for GMM (4½ days)	Certification Course for Green Mark Professional (approx. 26 days)	Certification Course for GMFM (approx. 6 days)
Complete Green Mark project at point of application	ONE Green Mark Gold or above projects (for new buildings) OR TWO Green Mark Gold or above projects (for new non-buildings e.g. office interior and parks)	THREE Green Mark Gold^{PLUS} or above (for new buildings)	Provide evidence of involvement in sustainable practices related to Operation & Maintenance and/or GM(EB) projects for at least ONE existing building project

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http://www.bca.gov.sg/GreenMark/others/GMM-GMP-GMFM_AppInForm.pdf

Building and Construction Authority

** Applications to be submitted by post.*

CERTIFIED GREEN MARK MANAGER / PROFESSIONAL CERTIFIED GREEN MARK FACILITIES MANAGER APPLICATION FORM

Affix a recent passport size colour photograph here

To: The Group Director
Technology Development Group
Building and Construction Authority
5 Maxwell Road #17-00
Tower Block, MND Complex
Singapore 069110

Please tick:

- ☐ **Certified Green Mark Manager**
- ☐ **Certified Green Mark Professional**
- ☐ **Certified Green Mark Facilities Manager**

A Personal Particulars

1 Full Name (in BLOCK letters):

*Mr/Mrs/Miss/Mdm:_____ Chinese characters: _____
(Underline surname) (if applicable)

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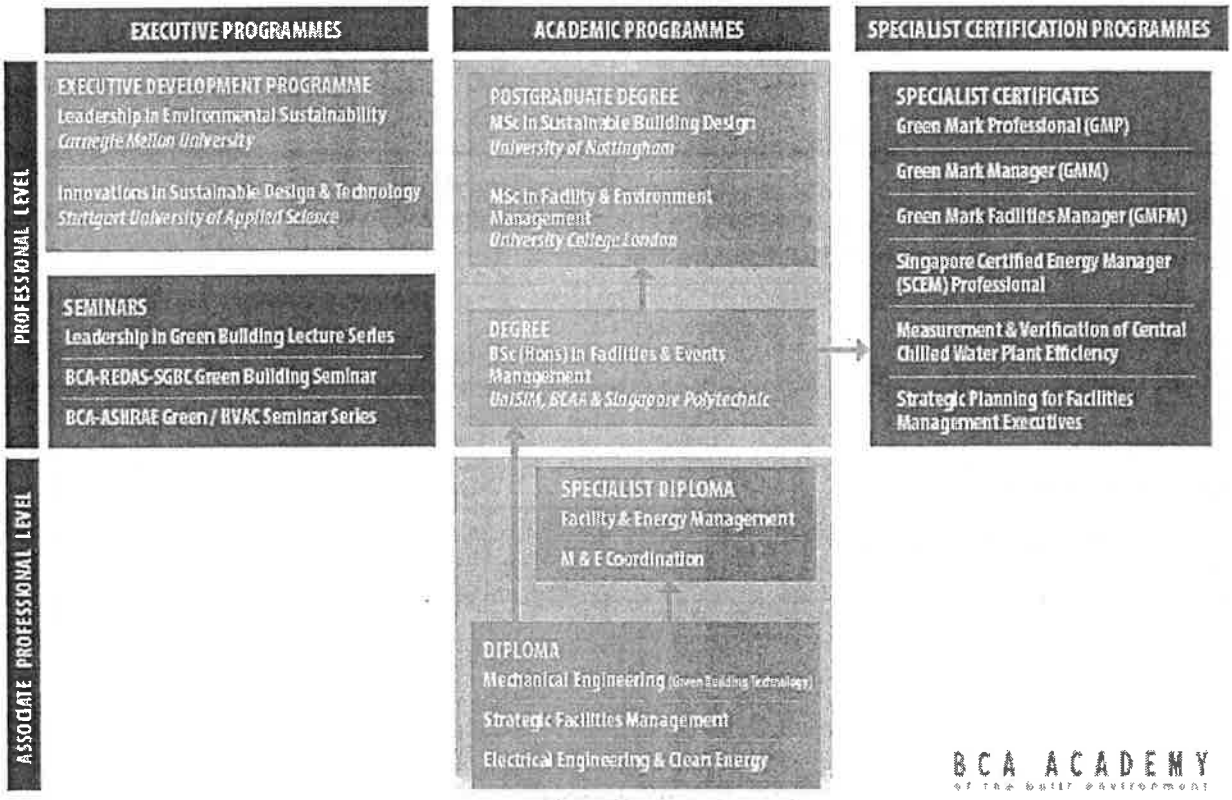
MAINTAINING CERTIFICATION

Activities	Certified GMM & GMFM	Certified Green Mark Professional (GMP)
Validity	No expiry date	GMP certification is valid for 3 years
Continuous Practice & Continuing Education	Refer to 'Refresher Training' below	TWO Green Mark Gold^{PLUS} or above new building projects OR ONE Green Mark Gold^{PLUS} or above new building project + 30 hours of green-related training
Refresher Training	Certified GMM / GMP / GMFM have to undergo refresher training every 2 years from the date of being certified.	

Training Framework to Build **Green Collar Workforce**



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Technische Universität Braunschweig

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TU Braunschweig-BCA Executive Development Programme:

INNOVATIONS IN SUSTAINABLE DESIGN AND TECHNOLOGY 2012

Location:
Germany - Frankfurt, Berlin, Braunschweig and Kassel

Duration:
3rd – 7th September 12

10% discount for registration before 31 July 12

Accreditation
- **BOA-SIA: 4 CPD points**
- **PEB: 34 PDUs**

Format:
i) Lecture sessions with leading experts sharing on innovative concepts/key developments in sustainable design & cutting-edge technologies;
ii) Learning Journeys to eco-settlement, successful retrofits, energy self-sufficient buildings & smart grid projects.

PROJECT VISITS

- Deutsche Bank Greentowers *(LEED Platinum & DGNB Gold Certification)*
- SOLON Corporate Headquarter *(Best Office Award & high energy efficiency building)*
- Reichstag German Parliament
- European Central Bank Building
- Goethe-University Frankfurt
- Commerzbank
- Passive House Settlement *(Passive House Standard)*
- SMA Solar Technology AG *(CO_2 neutral energy concept & net plus energy building)*
- Future Workplace *(experimental space for innovative facilities)*
- Energieforum Berlin *(centre for green businesses)*


SOLON Corporate Headquarter


Deutsche Bank Greentowers


Energieforum Berlin

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Green Collar Workforce
(Source: BCA A)

2400 attended GMM Course

470 attended GMFM Course

170 attended / attending GMP Course

Thank you for your attention!

TRAINEE GUIDE

Award of Certificate

A minimum of 75% class attendance and passed the end-of-course assessment comprising of a group project (case study with presentations) and MCQ examination (1-hour), will be awarded the **Certificate of Successful Completion**. A minimum of 50% mark is required to pass.

For those who do not sit for the assessment, but have a minimum of 75% class attendance, will be issued with a **Statement of Attendance**.

Assessment

There are a number of reasons for having assessable tasks as part of this GMM programme. The assessable tasks are designed to encourage you to explore and understand the subject more fully.

Tasks	Weight	Passing Mark
Written Test (1-hour), 40 MCQs	100%	50%
Group Assignment & Presentation, Group of 5-7 members	100%	50%
Peer Assessment	25 points	12.5 points

Please refer to attached Form 1 and Form 2.