Project 1

Understanding the Impact of Airport Systems on Airport operations

Introduction

The main aim of various airport systems is to support the 5 key elements of airport operations namely airport capacity, operational efficiency, aviation security/safety, customer service and financial sustainability.

The main objective of this Project is to give each student the opportunity to better appreciate how various airport systems could enhance the key elements of airport operations and understand how to plan for their introduction in a new airport or for the expansion of an airport.

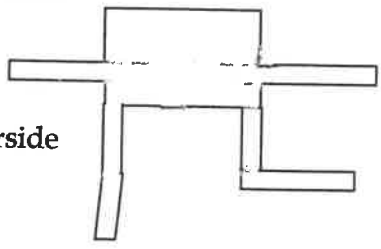
It also provides students with an opportunity to showcase how the various airport systems with the incorporation of some existing breakthrough technologies such as information technology, Radio Frequency Identification (RFID) technology, biometric technology and artificial intelligence technology, etc. could further enhance the seamlessness of air travel in future.

This is an Individual Project which will split into 5 Parts. Student is required to compile a written report (40%) and make an oral presentation of the written report (10%). The scope of the Project is as follows.

Project Description

Balipatana Airport is experiencing rapid traffic growth and is planning to build a new airport with a single passenger terminal. The concept layout plan of the Terminal is shown below. The size and dimensions of the Terminal are to be determined based on the proposals recommended:-

Landside



Airside

The following planning parameters are to be used:-

Airport passenger capacity: 20 million passengers movements per annum (20 mppa)
Hourly peak departure passenger capacity: 4,000
Hourly peak arrival passenger capacity: 3,000
Annual aircraft movements: 85,000
Hourly peak aircraft movements: 35
Hourly peak departure movements: 22
Hourly peak arrival movements: 18
Historical baggage/passenger ratio: 1.6/1
Expected Number of operating airlines: 30
Expected main aircraft types: B747 (10%), B777 (30%), B787 (10%), B737 (10%), A350 (10%), A340 (10%), A320 (10%), ATR72 (10%)
Expected passenger profile: young travellers (60%)

You are required to give your proposals with good justifications on the following airport systems/facilities required for the new airport Terminal.

Part 1

Passenger Check-in System (PCS)

- Describe briefly each type of check-in facilities:
  - manual counters, self-service kiosks, etc.
  - advantages of each type of check-in facilities
  - your recommendation on the types of check-in facilities proposed and reasons
  - total number of each type of check-in facility proposed and reasons

- Describe briefly each type of check-in facilities (counter or kiosk) layout:
  - linear, island and flow-through layout
  - advantages and disadvantages of each type of layout
  - your recommendation on the type of layout proposed and reasons
  - Drawing of the layout plan of all check-in facilities proposed

- Describe briefly each concept of check-in:
  - common check-in concept, flight check-in concept or combination of both
  - advantages and disadvantages of each concept
  - your recommendation on the concept of check-in and reasons

Part 2

Baggage Handling System (BHS)

- Describe briefly each type of BHS:
  - manual, semi-automated or fully automated sortation system
  - your recommendation on the type of BHS proposed and reasons

- Number of race-track conveyors proposed at Baggage Make-up area (departure)

- Your recommended number and reasons

- Number of inline security screening machines needed, if applicable, and reasons
- Number of baggage reclaim conveyors proposed at Baggage Break-down area (arrival)
    - Your recommended number and reasons

- Provide a schematic diagram of how the BHS components (inline security screening machines (if applicable) and make-up conveyors) are connected to all the check-in facilities.

Part 3

Passenger Loading Bridge (PLB)

- Describe briefly each type of PLB:
    - Pedestal and apron-drive
    - advantages and disadvantages of each type of PLB
    - your recommendation on the types of PLB proposed and reasons (it is assumed that each PLB can handle about 0.5 million passengers movements per annum (mppa))
- Provide a schematic drawing of the PLBs around the Terminal and the dimensions of each pier.

Part 4

Automated People Mover System (APMS)

- Describe briefly the benefits of APMS.
- Is APMS recommended (or not) and reasons?

Part 5

Seamless Travel (FAST)

Make observations on Changi Airport's operations, evaluate and propose how the travel through Balipatana Airport could be made seamless when incorporating certain technologies such as information technology, biometric technology, Radio Frequency Identification (RFID) technology and artificial intelligence (AI) technology, etc. where applicable.

Please describe a scenario of your proposed seamless departure processes from check-in till boarding (i.e. without human intervention and yet fulfill all the functionalities at each departure process) and how it could be achieved with the incorporation of the above technologies.

Project Written Report

The project report (not more than 3,000 words) should include:-

- A brief introduction on the objectives of the project;
- A brief description and justifications for the various airport systems proposed, where applicable:
    - Part 1 - Passenger Check-in System (PCS)
    - Part 2 - Baggage Handling System (BHS)
    - Part 3 - Passenger Loading Bridge (PLB)
    - Part 4 - Automated People Mover System (APMS)
    - Part 5 - A brief description of a proposed scenario of seamless departure processes
- A short conclusion of the project (i.e. summary of your proposals)

The marks for the written report is as follows:

S/No	Component	Marks
1	Introduction of project objectives	5
2	Description and justifications for the various systems: -	
	- Part 1 - Passenger Check-in System (PCS)	30
	- Part 2 - Baggage Handling System (BHS)	20
	- Part 3 - Passenger Loading Bridge (PLB)	20
	- Part 4 - Automated People Mover System (APMS)	10
	- Part 5 - Description of a proposed scenario of seamless departure process and how it could be achieved	10
4	Conclusion (summary of proposals)	5
	Total	**100**

A marking rubric for the written report (40%) and the oral presentation (10%) is attached for your reference.

Project Submission Instructions:

- Due Date: 25 Jan 2019 Friday, 2359 Hrs (Refer to Polymall for details of Due Date for each Part of the Project)
- Hardcopy submission is required
- Attach first page of "Safe-Assign" of your written report

- Attach the signed **"Declaration of Originality"** as the cover page
- Late submissions will be penalized as follows:-

If you submit ...	You will be awarded
Within the next 3 calendar days from the deadline	80% of the actual mark for work done
After 3 calendar days from the deadline	0 mark

Temasek POLYTECHNIC Bringing education to life and life to education

Diploma in Engineering (Aviation Management)

Airport Systems
ECAT 101

Declaration of Originality

Student Name: Admin No. Signature

_____

Class: _____

Date: _____

By submitting this work, I / we declare that

- I am / we are the originator(s) of this work.
- I / we have appropriately acknowledged all other original sources used in this work.
- I / We understand that Plagiarism is the act of taking and using the whole or any part of another person's work and presenting it as my/ our own without proper acknowledgement.
- I / We understand that Plagiarism is an academic offence and if I am/we are found to have committed or abetted the offence of plagiarism in relation to this submitted work, disciplinary action will be enforced.

AY2018/2019 (OCT Semester)
Project Assessment Rubric
Subject: Airport Systems (ECAT 101)

Class_____ **Name:** _____ **Admin No.**_____ **Date** _____

Criteria		Excellent	Good	Average	Poor
Introduction		Excellent and succinct introduction of Project	Good introduction of Project	Average introduction of Project	Poor introduction of Project
	5%	5	4	3	<3
Part 1 - Passenger Check-in System (PCS)		Very comprehensive description of PCS and Excellent justifications on Recommendation.	Fairly clear description of PCS and Good justifications on recommendation.	Average description of PCS and average justifications on Recommendatinon	Poor description on PCS and poor justification on Recommendation.
	30%	26 to 30	21 to 25	16 to 20	< 16
Part 2 - Baggage Handling Systems (BHS)		Very comprehensive description of BHSS and Excellent justifications on Recommendation.	Fairly clear description of BHS and Good justifications on recommendation.	Average description of BHS and average justifications on Recommendatinon	Poor description on BHS and poor justification on Recommendation.
	20%	17 to 20	13 to 16	9 to 12	< 9
Part 3 - Passenger Loading Bridge (PLB)		Very comprehensive description of PLB and Excellent justifications on Recommendation.	Fairly clear description of PLB and Good justifications on recommendation.	Average description of PLB and average justifications on Recommendatinon	Poor description on PLB and poor justification on Recommendation.
	20%	17 to 20	13 to 16	9 to 12	<9
Part 4 - Automated People Mover System (APMS)		Very comprehensive description of APMS and Excellent justifications on Recommendation.	Fairly clear description of APMS and Good justifications on recommendation.	Average description of APMS and average justifications on Recommendatinon	Poor description on APMS and poor justification on Recommendation.
	10%	9 to 10	7 to 8	5 to 6	<5
Part 5 - Seamless Travel Concept		Very comprehensive description of Seamless travel concept with appropriate use of technologies.	Fairly clear description of Seamless travel concept and application of tecxhnologies.	Average description of Seamless travel concept and application of technologies.	Poor description of Seamless travel concept and poor application of technologies.
	10%	9 to 10	7 to 8	5 to 6	< 5
Conclusion		Excellent and succinct conclusion of Project	Good conslusion of Project	Average conclusion of Project	Poor conclusion of Project
	5%	5	4	3	<3
				Sub-Total(40%)	

Oral Presentation		Very comprehensive and clear presentation of the	Fairly clear understanding and presentation of the	Average understanding and presentation of the	Poor understanding and presentation of the
	100%	90-100	70-90	50-70	<50
				Sub-Total(10%)	
Overall Project				**Grand-Total(50%)**	