

Information Technology in a Global Society for the IB Diploma

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Table of Contents

This is the table of contents for the book **Information Technology in a Global Society for the IB Diploma**, by Stuart Gray. This is the first textbook written specifically for the new IB ITGS syllabus, covering IT systems, social impacts and ethical issues, and each area of application. The text provides engaging content that blends clear examples of technical concepts with consideration of social issues. Discussion points for extended independent learning and complete, modern examples are included to enhance teaching and understanding, and ensure students get the best possible experience from the ITGS course.

Textbook features include:

- Clear objectives for each chapter, tied directly to the ITGS syllabus, so you can be sure that all aspects of the course are being covered.
- Course content is explained through clear and up to date examples, plus historical context.
- Over 200 varied exercises, mixing ethical discussion points, classroom exercises, practical activities, and exam style questions to cover the syllabus content from a variety of assessment angles. Theory of Knowledge (TOK) links are included, enabling integration with the IB core hexagon.
- Over 300 diagrams, photographs, and illustrations to bring topics alive.
- Key language review for every chapter, plus a complete glossary of ITGS terminology.
- Fully cited examples in every chapter mean students can extend their learning with wider reading—an essential part of IB courses.
- Online support to extend learning with additional case studies, links, and activities.

Support material, including additional exercises, further reading and book purchasing information, can be found at the book's website www.itgstextbook.com

Using this textbook

Information Technology in a Global Society is the first textbook written specifically for the new IB Information Technology in a Global Society syllabus, covering technical systems, social impacts and ethical issues, and each area of application. The book has a number of features to enhance teaching and understanding and ensure students get the best experience possible from the ITGS course.

Chapter Contents

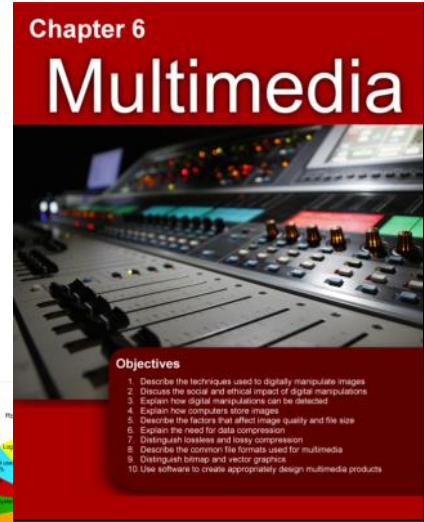
Each chapter starts with a set of **clear objectives** tied directly to the ITGS syllabus, so you can be sure that all aspects of the course are being covered.

The course content is covered through **up to date examples**, supported by varied exercises, with a mix of **ethical discussion points**, **classroom activities**, guided and unguided **practical activities**, and **exam style questions** to cover the syllabus content from a variety of assessment angles. **Theory of Knowledge (TOK)** links are provided where appropriate, enabling integration with the IB core. The **fully cited examples** in each chapter mean students can extend their learning with wider reading—an essential part of IB courses.

Each chapter is illustrated with clear photographs and original diagrams to highlight and clarify key points and concepts. **Common mistakes**, based on the author's experience with ITGS students and examination grading, are highlighted and corrected so that they will not be repeated in the future!

Key Language and Glossary

Each chapter has a comprehensive review section which includes all key language used in that chapter. At the back of the book you will find a complete glossary of all key language found in the text, with precise definitions and links to relevant chapters.



Robotics

A robot is a computer controlled system that performs manual physical tasks. Robots can be autonomous using artificial intelligence or computational intelligence techniques to manage their environment and perform their jobs, or they can be remotely controlled by a human operator. Robots are primarily used for three types of physical jobs:

- Dangerous jobs – such as cleaning up nuclear waste or performing bomb disposal
- Heavy or repetitive jobs – such as manufacturing jobs in factories or on production lines
- Exploring inaccessible environments – such as the extreme ocean depths or the surfaces of other planets, which are difficult or impossible for humans to access

Social impacts of robots

Robots cause a variety of positive social impacts. Robots used for hazardous jobs like bomb disposal (Figure 16-11) clearly reduce the risk of death or serious injury to humans. **Exploration robots** help increase scientific knowledge – they have been used to locate and recover the wreckage of ships and aircraft lost at sea (including helping to find the wreck of the Titanic in 1985), and in land there robots have been used on the surface of Mars, moving around the Martian surface and sending images and photographs back to Earth. **Mineral extraction** in these environments would be significantly more expensive and dangerous than working in them. **Autonomous space vehicles** have also been used to the Mars and Jovian moons to simplify the costs of bringing them in. In these cases, there is no need to send a human crew (who would need their own supplies) on such relatively inaccessible missions.



Figure 16-11 A US Navy remote operated robot (ROV) designed to play football in the RoboCup league ring.

Figure 16-12 Common applications for robots

Carrier robots such as the Big Dog move across rough terrain carrying heavy loads for the military. The RAIL (Railfield Extraction Assist Robot) robot is designed to rescue workers on the battlefield, lowering the need for ladders to enter the low line. **Health and rescue robots**, also being developed to search environments such as the rubble of buildings after an earthquake. Many of these are designed to avoid through gaps where humans could not fit, or to assemble buildings that are collapse without opening (Figure 16-12).

Domestic robots are available to assist in cleaning jobs around the house, while others like the PARO and PEARL can assist elderly people by providing support when



Figure 16-12 Common applications for robots

Objectives

1. Describe the techniques used to digitally manipulate images
2. Discuss the social and ethical impact of digital manipulations
3. Explain how digital manipulations can be detected
4. Explain how computers store images
5. Describe the factors that affect image quality and file size
6. Explain the need for data compression
7. Distinguish lossless and lossy compression
8. Describe the common file formats used for multimedia
9. Distinguish binary and vector graphics
10. Use software to create appropriately design multimedia products

ITGS

skill	reference table	index
concept	knowledge base	word processing
city	knowledge engineer	word theory
computer	knowledge representation	word recognition
data	logic	word processing
document	machine learning	word processing
file	machine translation	word processing
font	natural language processing	word processing
graph	pattern recognition	word processing
image	pattern vision	word processing
input	procedural vision	word processing
output	robot	word processing
robot	robot	word processing
software	robotic arm	word processing
system	robotic manipulator	word processing
technology	robotic system	word processing

For a piece of art, it can be for any form (drawing, painting, writing, music) that allows-related piece of work (drawing, writing, music, etc.). This may be any being (entity) involved (i.e. via a photo-related using graphics software) via the following operations:

Can it be used to create something that is not possible to be created by hand?

Can it be used to create something that is not possible to be created by hand?

Can it be used to create something that is not possible to be created by hand?

Online Support and Resources

This textbook's website, www.itgstextbook.com, provides additional resources to support the use of the book. Students can find useful links to examples and case studies related to the topics covered in the text, while teachers can find additional activities, exercises and exam questions, and rubrics for the main exercises.



Contents

Introduction

What is ITGS?	2
The ITGS Triangle.....	3
Strand 1: Social and ethical significance	4
Analysing ITGS Situations.....	6
Analysing the One Laptop Per Child Project.....	7
Strand 2: Application to specific areas.....	8
Strand 3: IT Systems	9
Technology versus Information Technology	9
Chapter Review	10

Hardware

Types of computer.....	14
Input devices.....	19
Output devices.....	27
Computer access for disabled users	29
Processor technology.....	30
Storage devices.....	32
Hard disk security and privacy	35
Storing data: bits and bytes	36
Failover systems.....	38
Ports & Connectors.....	39
Chapter Review	40

Software

Operating systems.....	44
Platforms.....	44
Common operating systems.....	45
Selecting and installing an operating system.....	46
Utility software	47
Disk fragmentation.....	48
Backups.....	49
Application software.....	50
Software licences.....	55
Open source versus closed source.....	56
Cloud computing.....	58
User interfaces.....	60
Getting help	61
Software reliability	62
Case Study: Therac-25.....	63
Chapter Review	64

Networks

Network components.....	68
Network architecture	70
Monitoring networks	71
Firewalls.....	73

Proxy servers.....	73
Types of network.....	74
Network connections	76
Communicating on a network.....	78
The Internet.....	80
What is Web 2.0?	85
Chapter Review	86

Security

Authentication.....	90
Hacking.....	94
Malicious software	96
Spam	100
Phishing.....	104
Encryption.....	106
Wireless security.....	110
Physical security.....	111
Chapter Review	112

Multimedia

Bitmap graphics.....	116
Social impacts	118
Image storage.....	122
Compression	124
Vector graphics.....	128
Creating vector graphics	131
Common multimedia file formats.....	132
Digital audio	133
Digital video.....	134
Intellectual property	135
Desktop publishing and word processing	136
Presentations.....	138
Chapter Review	140

Databases

Database Management Systems	144
Database structure.....	145
Flat file databases	146
Normalisation and relational databases.....	147
Queries.....	150
Forms	152
Reports.....	153
Integrity	154
Privacy	158
Security	161
Chapter Review	162

Contents

Computer Models and Simulations

Computer models	166
Creating a simple climate model	170
Problems with models	172
Development of climate models	174
High performance computing	176
Visualisation.....	177
Creating a missile trajectory model.....	178
Computer simulations	180
Spreadsheet review	182
Chapter Review	184

Business & Employment

Traditional Businesses	188
Employee monitoring.....	188
Teleworking.....	190
Mail merge and macros.....	192
The Internet, intranets, and extranets.....	193
Spreadsheets.....	194
Banking and digital money.....	196
IT in supermarkets.....	196
Online Business.....	198
E-commerce	198
Web design.....	202
E-marketing	210
Transportation Business.....	215
Travel sites	215
Body scanners.....	216
Vehicle tracking.....	216
Package tracking	216
Smart cars.....	217
Chapter Review.....	218

Education

IT in Teaching and Learning	222
Web 2.0 in the classroom	224
Open courseware.....	225
Game based learning.....	226
Web based exams	227
High tech cheating.....	227
Hardware technologies.....	229
Provision for special needs.....	229
Laptops in the classroom.....	230
School administration	233
Chapter Review	234

Environment

Data logging.....	238
Satellite communication and imaging	240
Online mapping.....	241
Geographical Information Systems.....	242
GPS networks	243
Environmental impacts	244
Electronic waste.....	246
Computer donations and the digital divide	251
Chapter Review	252

Health

Diagnostic and Therapeutic Tools	256
Telemedicine	256
Electronic Medical Records	258
E-Prescriptions	259
Medical expert systems.....	260
Virtual reality therapy.....	260
Prosthetic devices	261
Robotic surgery tools.....	261
Patient simulators	262
Medical Advice.....	263
Mobile phones for health education.....	263
Online medical advice.....	264
Medical Research	266
Disease mapping.....	266
The Human Genome Project	266
Distributed disease research.....	267
Drug interaction models	267
Psychological considerations	267
Physical considerations.....	268
Computer accessibility for disabled users.....	269
Chapter Review	270

Home and Leisure

Smart homes	274
Digital policing	275
Digital entertainment.....	277
Published and broadcast information	281
Digital preservation	284
Chapter Review	286

Contents

Politics & Government

Government control of the Internet	290
E-Passports	293
Political campaigning.....	294
Electronic voting.....	295
Online government	298
Government databases	300
Military use of IT	302
Chapter Review	306

IT Systems in Organisations (HL)

Types of development.....	310
Legacy systems	310
System development life-cycle	313
Analysis	313
Design	317
Implementation.....	320
Testing.....	320
CMMI.....	321
Installation.....	322
Maintenance	322
Development approach	324
Project management methodologies	325
Chapter Review	328

Artificial Intelligence and Robotics (HL)

What is intelligence?	332
Expert Systems	335
Other Artificial Intelligence techniques.....	338
Searching.....	338
Heuristics	338
Computational Intelligence techniques.....	339
Pattern recognition	339
Natural language processing.....	339
Representing knowledge	340
Neural networks	341
Robotics	343
Social impact of robots.....	343
Ethical issues	344
Sensing the world.....	345
Robotic output devices	346
Chapter Review	348

Glossary	351
-----------------------	-----

Credits	368
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