Game Application & Technology

Introduction

Computer, mobile, and console games represent a multi-billion dollar global industry. Game Application and Technology (GAT) program offers dedicated degrees in game development, giving students the technical expertise they need to enter the industry confidently. GAT program is designed specifically by Computer Science, BINUS UNIVERSITY to provide students with knowledge and skills to develop and create a variety of applied technology in the field of game technology. BINUS UNIVERSITY found this program in September 2012, and it became one of the best programs under the coordination of School of Computer Science. In collaboration with several renowned game industries, GAT program always make continuous improvement in our curriculum, human resources and facilities. The GAT Lab, equipped with high specification computers and dedicated audio editing studio, will facilitate the students and lecturers to collaborate and deliver high quality games.

GAT program is designed to adapt the dynamically changing creative industries landscape while ensuring a solid academic foundation and aligned to industry expectations. GAT focuses on game art, game design, and game programming. The structure of the course allows students to gain valuable practical experience in building software systems, and also apply knowledge in creative game design. GAT program have a strong base in computer science foundation subjects as well as offering the theoretical and critical thinking behind current digital technologies. Students will learn in a project orientated environment that encourages collaboration with industries. This collaboration helps them discover creative solutions to contemporary design challenges. Students are encouraged to collaborate, work according to deadlines, maintain attendance levels and develop strong communication skills. As a result, graduates are internationally renowned for their expertise and confident to enter the workplace as newly skilled professionals rather than technicians.

Vision

Become a study program of choice in Computer Science, focus in creative software solutions for business and industry, recognized internationally, championing innovation and produce graduates with international qualification.

Mission

The mission of Game Application and Technology Program is to contribute to the global community through the provision of world-class education by:

1. Educating student in the fundamental skills, knowledge, and practice of recent mobile technologies and architectures, wireless technologies, mobile software development, and game design;
2. Conducting research and providing game application and technology professional services with an emphasis on the application of knowledge for society's development;
3. Sharing the application of knowledge related to game application & technology with a view to Indonesians' and the international community quality of life;
4. Influencing students & lecturers to be creative, value-adding and competitive at an international level in game application & technology, by creating a suitable environment;
5. Preparing students as smart and skilled game application & technology professionals, leaders, and entrepreneurs in the global market and/ or to continue in related disciplines.

Program Objective

The objectives of the program are:

1. To provide students with a solid foundation of mathematical, algorithm principles, computer science knowledge and ethical that will be needed in IT practice;
2. To provide students with skills to apply design and development principles in the construction of software system applied in database technology, intelligence system, networking, multimedia development, game design and game technology;
3. To prepare students with abilities to keep up-to-date with the latest Information Technology specially in computer game technology trends, developments and industries;
4. To prepare students with abilities in problem solving and good communication skills to be able to work as an individual or in a team in an IT environment.

Student Outcomes

After completing the study, graduates are:

1. Able to create software application design with the implementation of database system principal design to solve structured and semi-structured data;
2. Able to design software application solution based on problem analysis which can be solved with structured approach in informatics area;
3. Able to assess information and communication technology trend to deliver alternative solution of software development;
4. Able to create game software with the implementation of multimedia, computer network, and applicative database with use of artificial intelligence algorithm to solve real industry problems.

Prospective Career of the Graduates

After finishing the program, the graduate of Game Application and Technology Program could follow a career as:

1. Game Engineer / Developer
2. Game Designer
3. Game Artist / Technical Artist
4. Game Audio Engineer
5. Game Director / Chief Technology Officer
6. Game Content Provider
7. Game Consultant
8. Game Publisher
9. Entrepreneur

Curriculum

The present curriculum used in the GAT program has been developed in line with the National Curriculum. Also, the local content has been developed in line with the Computer Science Curriculum standard of ACM (Association for Computing Machinery), several local and foreign universities, national and international game industry and community (developer, publisher), up-to-date game technologies, and market trends. In addition, the students will have the opportunity to forge their Employability & Entrepreneurial Skills in the enrichment program offered by the university to ensure the students are well prepared for their future career. In the program, the students will have the opportunity to work in the internship program offered by various global industries; experience study abroad; start their own business; involve in the world class research project; implement their

skills in the community development program. With these, our graduates are expected to be able to compete at both national and international level. Generally, the subjects of the curriculum are divided into these following groups of subjects:

Core Computer Science Group

The objective of this group is to provide grounding in GAT program through practice as well as the applied theory which is required by business both now and in the future. The subjects included are programming, algorithm design and analysis, software engineering, databases, computer graphs, interactive multimedia, computer and human interaction, operation system, Game Art, Game Programming, and Game Design.

Science

The objective of this group is to provide an understanding of mathematics as one of the principal foundations of computer science. Another objective is to give an understanding of scientific methodology (data collection, hypothesis, market research, analysis) in problem-solving.

Professional Practices

The objective of this group is to develop the personal strengths of the student and to provide him or her with a professional character, professionalism in their field, management skills, oral and written communication skills, understanding of business ethic, ability to work as a team, and to develop a "Binusian" Character.

The Field of GAT Subject

The objective is to give the students a solid foundation of software development skills and to introduce the specific skills needed for developing game applications. The students are expected to develop their skills and master the techniques which will allow them to conduct research for both their thesis and to continue their studies.

The field of GAT subjects:

1. Game Programming: to explore the various programming techniques and algorithm in game using industry-standard software and game engine.
2. Game Art: to explore various methodologies and techniques of game art and learn how to transform your art into assets for computer games and related industries using the latest technology and industry-standard software (2D and 3D, animation, modeling, character design).
3. Game Design: to explore the various methodologies and techniques of game story design, level design, gameplay design, human and computer interaction design.

All students of GAT program must follow these three fields to become our eligible graduates. The objective of these fields is to provide the students with the knowledge and skills required by business & industry and who wants to develop their own game company.

Course Structure

Sem	Code	Course Name	SCU	Total
1	CHAR6013	Character Building: Pancasila	2	20
	MATH6025	Discrete Mathematics	4	
	MATH6030	Linear Algebra	2	
	COMP6047	Algorithm and Programming*	4/2	
	STAT6026	Probability and Statistics	2	
	GAME6001	Introduction to Game Technology*	2	
	English University Courses I			
	ENGL6128	English in Focus	2	
	ENGL6130	English for Business Presentation	2	
2	CHAR6014	Character Building: Kewarganegaraan	2	21
	MATH6031	Calculus	4	
	COMP6048	Data Structures	4/2	
	GAME6002	Game Design*	2	
	GAME6004	Object Oriented Game Programming*	2/2	
	LANG6061	Indonesian	1	
	English University Courses II			
	ENGL6129	English Savvy	2	
	ENGL6131	English for Written Business Communication	2	
3	CHAR6015	Character Building: Agama	2	20
	COMP6049	Algorithm Design and Analysis	4	
	ENTR6003	Entrepreneurship I	2	
	GAME7029	2D Game Programming*	4	
	GAME6033	Storyboarding & Concept Art*	2	
	COMP6056	Program Design Methods	4	
	GAME6012	User Experiences*	2	
4	GAME6050	Game Engine Programming*	2	24
	CPEN6109	Computer Networks	2/2	
	ISYS6280	Database Systems	4/2	
	COMP6228	Artificial Intelligence	4	
	COMP6230	Software Engineering*/**	4	
	GAME7044	2D Animation*	2/2	
5	COMP6153	Operating System	2/2	24
	COMP6062	Compilation Techniques	4	
	ENTR6004	Entrepreneurship II	2	
	COMP6232	Human and Computer Interaction	2/2	
	GAME7045	Mobile & Web Game Programming*/**	4/2	
	GAME6043	3D Modeling for Games*	2/2	
6	**Enrichment Program I**		15	15
7	**Enrichment Program II**		16	16
8	GAME6026	Thesis	6	6
			TOTAL CREDIT 146 SCU	

*) This course is delivered in English

**) Entrepreneurship Embedded

English University Courses:

-) *For 1st Semester: English University Courses I, student with score BINUS UNIVERSITY English Proficiency Test less than 500 will take English in Focus, and student with score test greater than or equal to 500 will take English for Business Presentation*

-) *For 2nd Semester: English University Courses II, student with score BINUS UNIVERSITY English Proficiency Test less than 500 will take English Savvy, and student with score test greater than or equal to 500 will take English for Written Business Communication*

Enrichment Program I (6th Semester) & Enrichment Program II (7th Semester):

-)*Student will take one of enrichment program tracks (off campus).*

Enrichment Track Scheme

Track	Semester 6						Semester 7					
	I	RS	ENTR	CD	SA	*etc	I	RS	ENTR	CD	SA	*etc
1	v						v					
2		v						v				
3			v						v			
4				v			v					
5				v						v		
6				v							v	
7					v		v					
8					v					v		
9					v						v	
10						v	v					
11						v				v		
12						v					v	

Notes:
I   : Internship
RS   : Research
ENTR   : Entrepreneurship
CD   : Community Development
SA   : Study Abroad
*etc   : Department specific needs

Notes:
Student can choose one of the available tracks

Enrichment Internship Track

Code	Course Name	SCU	Total
Enrichment Program I			
GAME6061	Game Industry Experience	8	15
GAME6066	Game Production in Industry	4	
GAME6067	EES in Game Industry	3	
Enrichment Program II			
GAME6062	Game Development Practice in Industry	8	16
GAME6063	EES in Game Development Experience	4	
GAME6064	Game Research in Industry	4	

Enrichment Entrepreneurship Track

Code	Course Name	SCU	Total
Enrichment Program I			
ENTR6329	Business Start Up	8	15
ENTR6159	Business Model & Validation in Game Technology	2	
ENTR6160	Launching New Venture in Game Technology	2	
ENTR6380	EES in New Game Application and Technology Business	3	
Enrichment Program II			
ENTR6357	Growing a Business	8	16
ENTR6161	Lean Start Up & Business Plan in Game Technology	2	
ENTR6162	Venture Capital in Game Technology	2	
ENTR6368	EES in Game Application and Technology Business Experience	4	

Enrichment Research Track

Code	Course Name	SCU	Total
Enrichment Program I			
RSCH6244	Research Experience I	8	15
RSCH6119	Scientific Writing I in Game Technology	4	
RSCH6291	Global EES I (Team Work, Communication, Problem Solving & Decision Making)	3	
Enrichment Program II			
RSCH6259	Research Experience II	8	16
RSCH6120	Scientific Writing II in Game Technology	4	
RSCH6267	Global EES II (Self-Management, Planning & Organizing, Initiative & Enterprise)	4	

Enrichment Community Development Track

Code	Course Name	SCU	Total
Enrichment Program I			
CMDV6160	Community Outreach Project Implementation	8	15
CMDV6045	Community Outreach Project Design in Game Technology	4	
CMDV6204	Employability and Entrepreneurial Skills in Game Application and Technology Community	3	
Enrichment Program II			
CMDV6185	Community Development Project Implementation	8	16
CMDV6046	Community Development Project Design in Game Technology	4	
CMDV6194	Employability and Entrepreneurial Skills in Game Application and Technology Community Development	4	

Enrichment Study Abroad Track

Code	Course Name	SCU	Total
Elective courses list for study abroad*			
Enrichment Program I			
GLOB6005	Elective Course for Study Abroad 1	4	
GLOB6006	Elective Course for Study Abroad 2	4	
GLOB6007	Elective Course for Study Abroad 3	4	
GLOB6008	Elective Course for Study Abroad 4	4	
GLOB6009	Elective Course for Study Abroad 5	2	
GLOB6010	Elective Course for Study Abroad 6	2	
GLOB6011	Elective Course for Study Abroad 7	2	15
GLOB6012	Elective Course for Study Abroad 8	2	
GLOB6013	Elective Course for Study Abroad 9	2	
GLOB6014	Elective Course for Study Abroad 10	2	
GLOB6015	Elective Course for Study Abroad 11	2	
GLOB6016	Elective Course for Study Abroad 12	2	
GLOB6041	Elective Course for Study Abroad 25	3	
GLOB6042	Elective Course for Study Abroad 26	1	
Enrichment Program II			
GLOB6017	Elective Course for Study Abroad 13	4	
GLOB6018	Elective Course for Study Abroad 14	4	
GLOB6019	Elective Course for Study Abroad 15	4	
GLOB6020	Elective Course for Study Abroad 16	4	
GLOB6021	Elective Course for Study Abroad 17	2	
GLOB6022	Elective Course for Study Abroad 18	2	16
GLOB6023	Elective Course for Study Abroad 19	2	
GLOB6024	Elective Course for Study Abroad 20	2	
GLOB6025	Elective Course for Study Abroad 21	2	
GLOB6026	Elective Course for Study Abroad 22	2	
GLOB6027	Elective Course for Study Abroad 23	2	
GLOB6028	Elective Course for Study Abroad 24	2	

*)Transferred courses will be transferred based on credit transfer policies on study program with total of 15 credits for Enrichment Program I and 16 credits for Enrichment Program II.

Student should pass all of these quality controlled courses as listed below:

No	Code	Course Name	Minimum Grade
1	CHAR6013	Character Building: Pancasila	B
2	ENTR6004	Entrepreneurship II	C
3	COMP6047	Algorithm and Programming*	C
4	COMP6048	Data Structures*	C
5	COMP6056	Program Design Methods*	C
6	COMP6230	Software Engineering*	C
7	GAME6002	Game Design	C
8	GAME7029	2D Game Programming	C

*) Tutorial & Multipaper