

Title	Body Mechanics and Creature Animation
Level	5
Credits	20 credits

AIM(S)

- To explore and integrate studies of biomechanics, both internally and externally, in the study of motions and actions and forces in 3D space.
- To advance the student's understanding of simulating biophysical animation and their representation on realistic creatures and characters.

LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to:

- demonstrate an advanced appreciation and understanding of physical forces that induce states of change or determine the motion of a character in a scene.
- extend levels of visual acuity, motion studies and analytical techniques to help in the creature/character creation workflow.

INDICATIVE CONTENT

- Observational analysis and recording of motion (life drawing, photography, film, etc)
- Principles of Animation/Character Animation (e.g. pose to pose, slow-in, slow-out, etc.)
- Timing for animation; screen/interactive planning, co-ordination and timing
- Body mechanics, and animated turntables/moves in 3D space
- Animated cycles, key poses/gestures and acting/staging ideas
- An adoption of displaying weight and force and gravity (etc.) with reference to performance/styles of character
- 2D & 3D computer animation approaches for controlling characters.
- States of matter and their influence upon the action of characters in scenes
- Biological studies and analysis (including musculoskeletal systems)
- Environmental conditions and forces (e.g. gravity, friction, inertia)
- Technical animation and composition factors for characters and creatures within Film, VFX, Games.
- Anatomical studies and illustrations; human and animal biophysical motion studies
- Technically orientated exercises and simulations will incorporate other studies (e.g. bio-medical systems, effects upon physical bodies) and what is required to present these via 3D technology.
- Theoretical input will also cover topics related to the underpinning science and biophysical foundations of motion across life.

ASSESSMENT

Assessment Component 1 (of 1)

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Portfolio	e.g. set of animation moves/actions, methodology/process, 10 mins (per person) presentation (equivalent to 5000 words)	100%

Assessment Summary

Activity type	Percentage
Written exam	
Coursework	100%
Practical	
TOTAL	100%

READING LIST

Module Code	new	
Module Title	Body Mechanics and Creature Animation	
Classification	Reading List entry	Electronic*
Essential	ROBERTS, S (2004) <i>Character Animation in 3D: Use traditional drawing techniques to produce stunning CGI animation</i> , Focal Press.	☐
Essential	KUNDERT-GIBBS, J., (2009) <i>Action! Acting Lessons for CG Animators</i> , John Wiley & Sons	☐
Essential	WILLIAMS, R. (2002). <i>The Animator's Survival Kit: A Manual of Methods, Principles, and Formulas for Classical, Computer, Games, Stop Motion, and Internet Animators</i> : Faber & Faber.	☐
Essential	KNUDSON, D (2007) <i>Fundamentals of Biomechanics</i> , Springer	☐
Essential	COOPER, J (2019), <i>Game Anim: Video Game Animation Explained</i> , A.K.Peters/CRC Press.	☒
Essential	MCNEILL ALEXANDER, R (2006), <i>Principles of Animal Locomotion</i> , Princeton University Press	☐
Further	BOURG, D. M & BYWALEC, B (2013) <i>Physics for Game Developers: Science, math, and code for realistic effects</i> , O'Reilly Media	☒
Further	MATTESI, M (2017) <i>FORCE: Dynamic Life Drawing</i> CRC Press	☐
Further	STUMP, D. (2014), <i>Digital Cinematography: Fundamentals, Tools, Techniques, and Workflows</i> . Focal Press.	
Further	HOOKS, E. (2003) <i>Acting for Animators: A Complete Guide to Performance Animation</i> , Heinemann	☐

Further	John Lasseter, (1987) <i>"Principles of Traditional Animation Applied to 3D Computer Animation"</i> , Computer Graphics, pp. 35-44, 21:4, July 1987 (SIGGRAPH 87).	☒
Further	Living Lines Library https://livlily.blogspot.com/	☒
Further	Animation World Network https://www.awn.com/	☒