**What is a game** give player freedom of control, random events, more dynamic (movies or books: linear experience, a fairly direct mapping between viewer and creator) **Game Genres** Traditional (computerized card games/board games), Adventure (no action; text/graphical), Action (superset of many other genres, involves fast-paced combat and movements), Platformer (involves a character running and jumping in a playing field), RPG (characters need to explore the

world & have specific skill sets, also with character development), MMORPG (thousands of players simultaneously in a virtual world; intensive networking considerations in development), Racing/Sports (requires realistic graphics & gameplay experience), Education (design for a purpose) **Others** FPS, Survival, Battle Royale, MOBA, Turn-based strategy, Realtime strategy, Simulation, Puzzle games, Casual games

**Skillset** be creative, be able to collaborate & communicate, have a business/entrepreneurial mindset, be aware of the latest technologies **Hard skills** programming, math, physics, art & design, modelling, animation, sound/music design & composition, computer graphics, cinematography

**Development methodology:** Code-and-fix: aka firefighting, little/no planning, results in many technical problems, may only work for small team size & short

development cycles; Waterfall: processes well planned, set up accurate schedule & concrete milestones, works when nothing unexpected happens; Agile: plan for short periods of time, goals can change from time to time, more flexible

**Game Design** no formal or well-established map to follow, evolves over time, not a set of principles, but an activity **Basic Elements** Aesthetics, Story, Mechanics, Technology **Bartle's Taxonomy of Player Types** Achievers, Explorers, Socializers, Killers **Playtesting** get people to play your game and to check if they experience exactly what you have designed (key questions: Why, Who, Where, What and How)

**Frame** All updates are made in a buffer first and then contents of the buffer are copied to the screen; Unity default frame rate = 50fps; fixed timestep = 1 / FixedUpdate() frame rate; maximum allowed time step: limits the amount of time Unity will spend processing physics during a given frame update; **Game Loop** A collection of frames form a game loop (each iteration of the game loop is a frame); real-time games mostly update at 30-60 fps **Game Objects** anything in the world that needs to be updated and/or drawn every frame

**Audio** 5.1 surround system (Back/Surround Left, Back/Surround Right, Front Left, Front Right, Centre, Subwoofer), 7.1 surround system (Surround Back Left, Surround Back Right, Surround Left, Surround Right, Front Left, Front Right, Centre) analog to digital: sampling + quantization **Audio format** PCM: uncompressed raw data, .wav, sample rate 44.1kHz for CD quality, 8kHz for human voice, quantization 8/16/24 bit per sample; MP3: MPEG2 Layer 3, lossy compression by reducing audio parts not sensitive to human, bit rates: 32kbit/s acceptable for only speech, 96kbit/s acceptable for speech/low-quality streaming, 128 or 160kbit/s mid-range quality, 192kbit/s common high quality, 320kbit/s highest quality possible; WMA: audio data compression technology developed by Microsoft in 1999, lossy, encodes up to 48kHz with two discrete channels; MIDI;