

The background is a dark, textured surface with various white chalk-like sketches. On the left, there's a large sketch of a telescope. Above it, a globe is visible. Below the telescope, there are sketches of books and a stack of papers. On the right side, there are sketches of mathematical symbols like a percentage sign, a plus sign, and a less-than sign. The overall theme is technical and academic.

Technical Interview

CMP424: Professional Development

Today

- Patch 2
- The games industry
- Communication as a desirable skill
 - Little pitching exercise
- Technical interviews
 - Medium technical interview exercise

The background features a dark, textured collage of white line-art icons. These include a globe, a stack of books, a microscope, a test tube, a pencil, a ruler, and various geometric shapes like circles and triangles. The icons are scattered across the dark background, creating a scholarly or scientific atmosphere.

Patch 2

Technical Interview & Portfolio Building

Patch 2: Task and Exercise

Task: Portfolio Project Plan (5%)

Plan a personal project that would take you a few weeks.

The project should either:

- Use emergent technology – “this looks cool”,
- Deepen your expertise – “I want to be even better at this”, or
- Widen your knowledgebase – “I could improve at this”.

Minimum requirements:

- A slide deck with slides on:
 - What the project will be.
 - Your motivation for choosing the project.
 - The relevant documentation you will use.
 - System architecture.
 - Plans for sharing the work.

Deadline: Wednesday 9th October at midday.

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 - Plans for sharing the work.

Deadline: Wednesday 9th October at midday.

Technical Interview Questions (15%)

Create a series of technical interview questions and desired responses for a job listing (or one of the example posts)

Requirements:

- Ten question/excellent-answer pairs with prompts to support candidates.
- A template is provided for this (available on MLS)

Criteria:

- Questions are appropriate to the listing,
- Answers give accurate and well-explained detail.

Deadline: Wednesday 16th October at midday.

The background features a dark, textured surface with faint, light-colored chalk-like drawings of various school supplies. On the left, there is a globe showing continents. Above it, a ruler and two circular protractors are visible. In the upper center, a stack of books is drawn. To the right, a microscope is depicted. At the bottom, there are more geometric shapes like a compass and a ruler. A large, solid yellow rectangle is positioned at the bottom of the page, partially overlapping the text area.

The Scottish Games Industry

An Overview

- The industry is okay in comparison to others. But growth is slowing as are most industries.
- Dundee junior game programmer salary is £25,607.00 (Glassdoor, posted: 10/8/24, last visited: 2/9/24)
 - Dundee junior software engineer salary is £27,365.00

Entry-level jobs

- Rarely advertised openly.
- As much about who you know.
- A portfolio or a connection (or both) will get you an interview.
- An interview (or several interviews) will get you a job.

Scotland's Role

- Scotland has 7.7% of UK games companies and 9.8% of UK games developers. (2021-2023)
- Scotland has 8.2% of the UK population, so not a major overperformance.


Dundee's role

- Dundee however has the highest % of games jobs of any UK city at 1.1% of all private jobs, compared to UK average of 0.1%.
- 2.7% of all British gaming jobs are based in Dundee, despite have 0.22% of the population.
- Strong heritage from DMA design (now R*) and Abertay itself.
- Figures from Jan 2023: <https://www.centreforcities.org/blog/does-dundee-really-have-a-gaming-cluster/#:~:text=It%20became%20the%20city%20with,significantly%20above%20the%20national%20average.>

The background is a dark grey chalkboard with various white chalk sketches. On the left, there's a globe showing continents. Above it, a book is drawn with the word 'System' on its cover. To the right of the book, there are some circular diagrams and arrows. On the far right, a microscope is sketched. The overall theme is educational or academic.


Communication


Let's look at some jobs...
(Sept 2024, LinkedIn, Dundee +60km)


Third Kind Games

Senior Programmer

United Kingdom · 1 month ago · 71 applicants


 Remote · Full-time · Mid-Senior level

 1 company alum works here

 Skills: Communication, Back-End Web Development, +8 more


- You enjoy:
- Working with a highly experienced team on all areas of the game, both client and server.
 - Fully owning complex systems through design and development, working closely with the game designers and other disciplines to realise their visions.
 - Playing a key role in bug fixing and helping the team to deliver milestones.
 - Taking an active role in the mentoring and development of junior staff.
 - Using your passion for gaming, you will design, plan and develop high quality code systems, working closely with the game designers and other disciplines to realise their visions.
 - Good communication skills with the ability to contribute to Scrum meetings and create innovative solutions for our games.


Notice anything?

Orange Comet, Inc.


Roblox Game Programmer

United Kingdom · 3 weeks ago · 37 applicants

 Remote · Full-time · Mid-Senior level


 Skills: Programming, Communication, +8 more


- Requirements
- Minimum of three years of programming experience in Roblox with Lua(u)
 - Extensive knowledge of Roblox services, API, and security practices
 - Familiarity with professional workflow and tools such as Rojo
 - Proven ability to create game systems and features from scratch
 - Strong problem-solving skills and attention to detail
 - Excellent communication and teamwork skills
 - Ability to work with a remote team distributed across the world
 - Bachelor's degree in Computer Science, Software Engineering, or a related field preferred. Equivalent experience or certifications will also be considered

VirtueTech Recruitment Group

Mid Level- Angular Engineers | Node.js and Python | Greenfield Renewable Energy Platform | Fully Remote | £75,000

United Kingdom · 2 hours ago · 16 applicants

 Remote · Full-time · Mid-Senior level

 Skills: Python (Programming Language), JavaScript, +9 more

- Experience required for the Mid-level Angular, Node.js, Python Roles:
- Bachelor's degree in Computer Science, Engineering, or a related field.
 - 3+ years of experience in full-stack development.
 - Strong understanding of TypeScript and its benefits for writing type-safe and maintainable code.
 - Strong experience with Angular 17, Angular Material, SCSS, and TypeScript.
 - Familiarity with Python.
 - Experience with SQL databases (e.g., PostgreSQL, MySQL) and database design principles.
 - Familiarity with containerization technologies such as Docker for packaging and deploying applications.
 - Knowledge of security best practices, protocols, and standards (e.g., OWASP Top 10, TLS, OAuth).
 - Excellent problem-solving skills and attention to detail, with a track record of delivering high-quality software solutions.
 - Strong communication and collaboration skills, with the ability to work effectively in a cross-functional team environment.
 - Adaptability and willingness to take on new challenges and responsibilities in a startup environment.

Games Programmer (multiple roles)

Edinburgh, Scotland, United Kingdom · 7 months ago · 66 applicants

 Hybrid · Full-time · Mid-Senior level


 2 company alumni work here

 Skills: Programming, Communication, +8 more

Requirements


- Experience of the full game development lifecycle
- Design and content team collaboration experience
- Advanced C++ programming skills
- Solid experience with Unreal 4/5
- Excellent written/verbal communication skills
- Strong time management and organisation skills and an enthusiastic team worker
- A logical thinker with strong analytical skills
- Excellent Maths
- A real passion for games programming
- Experience working within a team


Not this.


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Programming roles are about more than just cutting code

- To work in a team, you have to share ideas.
 - Could be very technical, could be very high-level.
- To plan projects you have to negotiate, be persuasive and be reasonable.
- The best programmers are not necessarily the best candidates for a job opening.

Why communication matters

- Requirements gathering is a significant aspect of programming roles.
- You know a lot about games programming by this point, come the end of the year you will be an expert in one particular area (from your honours project).
 - What do you do if someone in your team/company is wrong?
- Important to be persuasive. Which can be hard.

Exercise: Game Jam Pitch (groups of 3-4, 15 minutes)

- It is Friday night, your group is a small programming-only team for a 48 hour game jam that has just begun.
- The theme is “Veiled by Shadow”. You can use any engine you want, but be conscious of the skills in your team.
- Make a plan privately for what your team should make for 5 minutes. Then take it in turns to pitch to the group for no more than 2 minutes.

Game Jam: Veiled By Shadow

- 5 minutes: come up with a design by yourself.
- Group size * 2 minutes: pitch to your team.
- Here is some rubbish generated art to “inspire”. I cannot explain the ash tray.



Reflection: What was good?

Were you convinced? What **good** things did your peers do to persuade you?

We will update this slide with suggestions.

William's advice for communicating

- Speak slowly and do not be afraid to take a moment to respond.
- Actively listen and seek clarification if you are unsure.
- Focus on clarity and watch your audience for cues they may not be following, adapt if they are not.
- Use metaphor, diagrams, props or slides if you can.



Technical Interviews

They come in many forms

Why have technical interviews?

- Essentially you are being assessed on two things:
 - Fundamentals
 - Communication
- You are not likely to get your first job due to expertise,
 - As an undergraduate, you probably are not an expert.
- As a junior, they will expect to spend weeks training you up, this process is to identify who will be most easily trained.

An example

We were told last year of a Dundee company interviewing Abertay graduates who struggled with the following question:

“In C++, how do you allocate new memory on the heap?”

This question is intentionally worded to be helpful. Interviewers rarely want to trip you up.

Let's examine some responses.

Response 1

Question: "In C++, how do you allocate new memory on the heap?"

Response: "The new keyword"

It is correct, but is it good?

Response 2

Question: "In C++, how do you allocate new memory on the heap?"

Response: "Heap memory is dynamically allocated using the new keyword, which returns a pointer, `int* p = new int`, for example. When you do allocate memory on the heap it is really important to deallocate it using the delete keyword to avoid memory leaks. Although a better way is to use smart pointers that will free memory when they go out of scope to handle this memory management for you."

General Advice

- Think aloud, explain your process and cover key considerations adjacent to the solution (like safe memory management).
 - Just be careful to stay on topic.
- Break the problem into manageable portions, and solve them individually.
- Use examples, ideally of work you have done, to help illustrate your point.
- Engage the interviewers, it should be conversational not a monologue, this should help you get prompts out of them also.

Nightmare scenario: The “I don’t know”

- Be honest, no-one has memorised the latest C++ standard, it is ok to not know things.
- For procedural questions “How would you go about doing **x**?” Fall back on explaining your process.
- For specific technical details, “How do you allocate new memory on the heap?” First be honest that you aren’t quite sure, then talk about what you understand of memory allocation in C++ and the difference between the heap and the stack.

The best advice, as ever, is to practice

- Some of the code test sites (LeetCode, hackerRank) have peer-reviewed mock interviews.
- Get together with friends and come up with your own (Patch 3B might help with this).
- Be asked to do them as a class activity in a lecture...

Class Activity: 25 minutes

Groups of 2 or 3

- On MLS, under week 3, there are three separate collections of interview questions.
- Pick one each, and practice with your partner, or asking the other two people in your group together.
- Note: Do not worry if you do not know some answers. You have not spent the last few days revising as you would before a proper interview.

What will the assessor see?

When we interview for roles at Abertay, we privately score candidates on communication and presentation, knowledge and understanding, research skills, self-determination and problem solving.

Each getting a score from 1-5, then collaboratively agreed by the panel. This gives a final value 4-20 which we then use to rank candidates. We can only hire someone above a certain threshold.

Practical advice

- Can you get questions ahead of time?
 - GlassDoor, asking others, scan job listing.
- Be professional
 - Be prompt, be polite (“thank you”).
- Have a prepared “any questions for us?” Question
 - “What team would I be working in if I got the role?”
 - “How closely does the code team collaborate with art and design?”
 - The best ones will be company-specific. E.g., “Do you see the company moving on to working on their own IP in the near future?”

A dark grey background featuring a collage of white, chalk-like sketches of various educational and scientific icons. These include a globe, a microscope, a book, a percentage sign, a ruler, and several arrows pointing in different directions.

Looking forward

Assignment briefs now available on MLS

3A: Plan a project

▪ Task: Portfolio Project Plan (5%)

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 - System architecture.
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Why?

- Practice presenting technical ideas,
- Consider personal skills development,
 - You have planned a project, why not just do it?
- Act on advice from Darren Butler.

Assessment

Ungraded, 5/5 for satisfying the criteria.

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3B: Develop technical interview

Create a series of technical interview questions and desired responses for a job listing (or one of the example posts)

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Why?

- Consideration of technical interview content and industry expectations.
- Reinforce foundational concepts.
- Engage with job postings.

Assessment

Quality of questions (30%), example answers (30%), prompts and guidance (20%), relevance of questions (10%), presentation (10%).

A template has been provided on MLS.

Next week: Guest Lecture, in-person in 1001.

Ninja Kiwi:

Dundee-based games company, most famous for Bloons Tower Defence games.

New game “Bloons Card Storm” due out soon. A CCG.

Lecturers:

- Dr Paul Robertson, senior programmer.
- Ms Aleisha Blair, programmer. (graduated from CGT in 2022)