



# Prompt Engineering

## Master Cheatsheet 2025

Complete Guide: Beginner to Advanced | RTCFR Framework

### ■ RTCFR Framework

The **RTCFR framework** is a powerful approach for crafting effective prompts:

R	<b>ROLE</b>	Define who AI should be	"You are a senior Python developer with 10+ years exp"
T	<b>TASK</b>	What to accomplish	"Write a function to validate email addresses"
C	<b>CONTEXT</b>	Background info	"This is for a signup form in a Flask web app"
F	<b>FEW-SHOT</b>	Example outputs	"test@email.com → Valid, test@ → Invalid"
R	<b>REPORT/TONE</b>	Format & style	"Return JSON: {email, is_valid, reason}"

### ■ RTCFR Complete Example

[R] Role:	"You are a professional content strategist specializing in B2B SaaS marketing."
[T] Task:	"Create 5 LinkedIn post ideas for our new AI automation tool launch."
[C] Context:	"Target audience: startup founders and CTOs. Tool automates repetitive tasks."
[F] Few-shot:	"Post 1: Hook   Insight   CTA Post 2: Story   Problem → Solution"
[R] Report:	"Professional but conversational. Under 200 words. Include emojis."

### ■ Quick RTCFR Template

You are [ROLE with expertise level].  
Your task is to [TASK - clear action verb + objective].  
Context: [CONTEXT - background, constraints, audience]  
Examples: Input: [example] → Output: [result]  
Format: [REPORT FORMAT] | Tone: [professional/casual/technical]

### ■ Other Prompt Frameworks

Framework	Components	Best For
CRAFT	Context, Role, Action, Format, Tone	General prompting
CO-STAR	Context, Objective, Style, Tone, Audience, Response	Marketing
RISEN	Role, Instructions, Steps, End goal, Narrowing	Multi-step tasks
RACE	Role, Action, Context, Expectation	Quick prompts

## ■ Basic Techniques

Technique	Description	Example
Zero-Shot	Ask directly, no examples	"Translate Hello to French"
Few-Shot	Provide 2-3 examples	"good→Positive, bad→Negative, great→?"
Role/Persona	Assign expertise	"You are a Harvard professor..."
Instruction	Step-by-step directions	"1. Read 2. Extract 3. Summarize"
Delimiter	Use markers	"""text"" or <context>...</context>

## ■ Intermediate Techniques

■ **Magic phrase:** "Let's think step by step" — dramatically improves reasoning!

Technique	How It Works	When to Use
Chain-of-Thought	"Let's think step by step"	Math, logic, reasoning
Self-Consistency	Generate 3-5 answers, pick majority	High-stakes decisions
Prompt Chaining	Output → Next Input	Multi-step workflows
Generated Knowledge	Generate facts, then use them	Research & analysis

## ■ Advanced Techniques

Technique	Description	Use Case
Tree of Thoughts	Explore multiple reasoning paths	Complex problem solving
ReAct	Thought → Action → Observation	Tool use, AI agents
Reflexion	Generate → Critique → Improve	Creative writing, code
Skeleton-of-Thought	Outline first, then expand	Long-form content
Meta-Prompting	Ask AI to improve prompts	Prompt optimization

## ■ Output Control

Control	Prompt Addition	Result
Format	"Respond in JSON/Markdown/Table"	Structured output
Length	"Max 100 words" or "3 sentences"	Controlled length
Uncertainty	"Say I'm not sure if uncertain"	Reduces hallucinations
No Preamble	"Skip intro, answer directly"	No fluff
Structure	"Headers: Overview, Details, Conclusion"	Organized content

## ■■ Mega Prompt Structure

#	Section	What to Include
1	Role	Expertise, experience, persona
2	Context	Background, situation, constraints
3	Task	Clear objective + action verb
4	Requirements	Must-haves, specific needs
5	Examples	Desired output format samples
6	Format	Response structure (JSON, Markdown, etc)
7	Tone	Voice and communication style

## ■ Power Phrases

Phrase	Effect
"Let's think step by step"	Activates chain-of-thought reasoning
"You are a world-class expert in..."	Focuses knowledge, improves quality
"If you're not sure, say so"	Reduces hallucinations
"Double-check your answer"	Triggers self-verification
"Explain your reasoning"	Gets transparent thought process
"Consider edge cases"	More thorough analysis

## ■ Common Mistakes & Fixes

■ Mistake	■ Fix
Vague: "Write something good"	"Write 500-word blog: intro, 3 points, conclusion"
No context given	"I'm building Flask app, need user auth help"
Too many tasks at once	Break into separate prompts
No examples provided	Add 1-2 examples of desired output
No format specified	"Format as JSON: {name, value, status}"

## ■ Quick Reference

Task Type	Technique	Key Phrase
Simple Q&A	Zero-Shot	Direct question
Specific format	Few-Shot + RTCFR	Show 2-3 examples
Math/Logic	Chain-of-Thought	"Let's think step by step"
Complex decisions	Tree of Thoughts	"Consider 3 approaches"
Multi-step workflow	Prompt Chaining	Sequential prompts

Creative writing

Role + Reflexion

Write → Critique → Improve

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■ Great prompts = Great results!