Proposal Budget Formulas

The OR Budget Templates were updated in 2024 to simplify salary and effort entries, which reduces the need to enter formulas. **You no longer have to annualize either salary or effort** and can now enter effort in either **Person Months** or as **% Time or Effort**, to match whatever format investigators share their effort with you.

This said, **some formulas are still helpful**:

For instance, if a Co-PI indicates that he will work 10% each Academic Year (AY) + 10% during 2 summer months, for the AY simply add 10% to a **% Time or Effort** row but for the summer, in a **Person Months** row, enter this formula:

=2*0.1

This indicates that the Co-PI will work 10% (or 0.1) of two months, or 0.20 months.

Personnel						*Enter effort either in Person Months (top section) or %*			
	Name/Role:	**Appt. Type**	**Effort Type**	**Base Salary**	**Months or %:**	***Person Months***			
						Per 1	**Per 2**	**Per 3**	**Per 4**
1	Co-PI - Cuthbert Calculus - SMR	9/12	SMR	166,425	Months	=2*0.1	0.20	0.20	0.20
2	GSR - TBD	12/12	CAL	64,990	Months	=9*0.25	2.25	2.25	2.25
	Personnel by %					***% Time or Effort***			
1	PI - Minerva McGonagall	12/12	CAL	202,080	%	15.0%	15.0%	15.0%	15.0%
2	Co-PI - Cuthbert Calculus - AY	9/12	AY	166,425	%	10.0%	10.0%	10.0%	10.0%
3	Co-PI - Henry Jones, Jr.	9/12	AY	166,425	%	10.0%	10.0%	10.0%	10.0%

Likewise, if you have a GSR who will commit 25% over 9 months, in a **Person Months** row enter this formula:

=9*0.25

This indicates the GSR will work 25% over 9 months (of a 12-month calendar year appointment), or 2.25 months.

IMPORTANT: Effort entered into Cayuse SP and the proposal submission system, such as Cayuse 424, should be annualized.

- For personnel with 9/12-month or 11/12-month appointments, **the percentage (%) effort entered in the spreadsheet is not annualized** and instead indicates their effort over 9 or 11 months.
    - To determine annualized effort simply refer to the **Personnel Reference** tab (at bottom) of the OR Budget Template.
        - The **Annual Effort based on 12 months** table reflects annualized effort as a %.
- **PM effort in the spreadsheet is already annualized over 12 months** for all appointment types (9/12, 11/12 & 12/12) but you can see all effort summarized in PM format in the **Person Months (For agency forms)** table under the **Personnel Reference** tab.
- **IMPORTANT: Add together annualized effort that was entered on two separate rows** for investigators with 9/12 or 11/12 appointments *(see screenshot below)*.

Personnel (For Reference)		Person Months (For agency forms) APPT TYPE and BASIS (9/12,11/12,12/12) must be correctly indicated on the request sheet to ensure person month accuracy			Annual Effort based on 12 months	
	Name/Role: Type? (Choose Below)	Period 1	Period 5	Type	Period 1	Period 5
1	Co-PI - Stephen Robinson - SMR	0.20	-	SMR	1.67%	
2	Co-PI - Stephen Robinson - AY	0.90	-	AY	7.50%	
		= 1.10 Person Months total			= 9.17% annual effort	

Formulas those unable to reference the **Personnel Reference** tab in the [OR Budget Templates]:

Formula to convert Person Months (PM) to percentage (%):

PM / 12 * 100

e.g., 0.2 / 12 * 100
= 0.0167 * 100
= 1.67%

As mentioned above, effort entered in Person Months (PM) is already annualized over 12 months.

- 0.2 PM reflects 10% effort over 2 summer months.

Formula to convert % to PM:

% * # of appointment months

e.g., 10% * 9 months
= 0.1 * 9
= 0.9 PM

In other words, 0.9 PM reflects 10% effort over 9 months.

Formula to convert un-annualized % to annualized % (over 12 months):

% * # of appointment months / 12 * 100

e.g., 10% * 9 months / 12 * 100
= 0.1 * 9 / 12 * 100
= 0.9 / 12 * 100
= 0.075 * 100
= 7.5%

In other words, 7.5% annualized effort reflects 10% effort over 9 months.

If an investigator has two different effort commitments in one project period:

Add the two periods together as in the screenshot above.

How to Calculate Equivalent Hourly Rates

For sponsors that request salary in **hourly rates**:

Based on a standard work week of 40 hours, a full-time employee works 2,080 hours per year (40 hours a week x 52 weeks a year). However, using a different methodology that starts with the monthly rather than hourly rate, **the University of California uses 2,088 to represent the estimated number of work hours in a typical year.**

Example: a PI with a base salary of $133,333 will commit 10% effort to a project.

1. $133,333/2,088 = **$63.86 effective hourly rate**

2. Add in the **fringe benefits**:
   $63.86 x fringe rate = $63.86 x i.e., 1.269 (1 + rate of 26.9%) = **$81.03 hourly rate + benefits**

   If fringe benefits are represented by a split rate, as shown in the screenshot below, determine the averaged rate using this formula:

   (1st rate x 1st # of months/12) + (2nd rate x 2nd # of months/12)

   Using the first row in the screenshot as an example:
   40.4% = 0.404 and 41.6% = 0.416
   ((0.404 x 1/12) + (0.416 x 11/12) =
   ((0.404 x 0.083) + (0.416 x 0.917) =
   (0.033532 + 0.381472) =
   0.415004, or 41.5%

FY Split:	*1/11*
UCPath CBR Group	**%**
Faculty, Acad, MSP, Safety	40.4/41.6
Faculty, Acad, MSP, Safety	40.4/41.6
HCOMP Faculty & SMG	26.5/27.3
All Other Staff	51.6/53.1
All Other Staff	51.6/53.1
All Other Staff	51.6/53.1

3. Determine **annual effort**:
   Effort = 2,088 * 0.1 (10%) = **208.8 hours**

4. Multiply **hourly rate + benefits** by **annual effort**:
   $81.03 x 208.8 hours = **$16,919.96 total salary for budget period 1**

5. Add a statement to the sponsor in the **budget justification** along these lines:
   - Indicated hourly rates are for proposal purposes only. Per UC policy, we will account based on annual base salary x effort.

Below are additional formulas you likely won't need if using the OR Budget Templates.

1. **Indirect costs** (also referred to as Facilities and Administrative costs)

Indirect costs are associated with the general operation of UC Davis and cannot be readily assigned to individual projects.

Indirect cost base [MTDC, TDC, or TC] * indirect cost rate = indirect costs

- **Indirect cost rate:** The proportion of indirect costs each program should bear using sound administrative principles.
    - The university commonly uses federally negotiated rates (NICRA) though rates may vary based on sponsor policy and program guidelines.
        - If a sponsor specifies a different rate, an exception to the NICRA rates may need to be approved by the UC Office of the President (UCOP).

- **Indirect cost base:** The amount of direct costs to which the indirect cost rate is applied.

    1. The most commonly used base at UC Davis is **Modified Total Direct Costs (MTDC).**
        - All negotiated rates at UC Davis are applied on an MTDC base as defined in our Negotiated Indirect Cost Rate Agreement (NICRA).
        - MTDC consists of all direct salaries and wages, applicable fringe benefits, materials and supplies, services, travel and up to the first $25,000 of each subaward (regardless of the period of performance of the subawards under the award).
        - MTDC excludes equipment, capital expenditures, charges for patient care, rental/lease costs of off-site facilities, tuition remission, scholarships and fellowships, participant support costs and the portion of each subaward in excess of $25,000.
        - MTDC can actually vary by organization. "MTDC" can mean any modified base. Check the specific agency guidelines for instructions on budget calculation.
            - Example: NIH training grants state 8% MTDC, but only tuition and equipment are excluded.
        - **F&A Cost formula based on MTDC:** Calculate the Total Direct Costs and subtract the excluded items listed above (or identified by the sponsor):

            a. **TDC – [excluded items] = MTDC Base**
            b. **MTDC Base x F&A Rate = F&A Costs**

2. **Total Direct Costs (TDC):** This base is typically used when a sponsor declines to pay UC Davis's federally approved indirect cost rate and an indirect cost waiver is granted by the University.
    - TDC includes all the direct costs being charged to the sponsor. Nothing is excluded from the base prior to calculating the indirect costs except:
        - Subawards to other UC campuses
        - Service agreements to other UC campuses
    - **F&A Cost formula based on TDC:** Indirect costs based on TDC do not include subawards or service agreements to other UC campuses.

    a. TDC – [subawards & service agreements to UC campuses] = TDC Base
    b. TDC Base x F&A Rate = F&A Costs

3. **Total Costs (TC):** This base is used when a sponsor states that only a certain percentage of Total Project Costs can be charged for indirect (F&A) costs.
    - As with TDC, nothing is excluded from the base prior to calculating the indirect costs except:
        - Subawards to other UC campuses
        - Service agreements to other UC campuses
    - Use this formula if **direct costs are known**:

    a. TDC – [subawards & service agreements to UC campuses] = TDC Base
    b. (TDC Base / (1-F&A Rate)) * F&A Rate = F&A Costs

        - Example: TDC Base = $100,000 and the F&A rate is 25%.
          ($100,000/(1-0.25)) * 0.25 =
          ($100,000/0.75) * 0.25 =
          $133,333 * 0.25 = $33,333
    - Use this formula if **only the total budget limit is known**:

    Total Budget Limit * F&A Rate = F&A Costs

        - Example: Your limit is $100,000 and the F&A rate is 10% TC.
          $100,000 x 10% = $10,000 *(and $90,000 in Direct Costs)*

4. **Total Federal Funds (TFF)** – best way to calculate these is to use OR Budget Template **F (USDA)**
    - Most US Dept of Agriculture (USDA) National Institute of Food and Agriculture (NIFA) projects require that we take the lesser of:
        - 30% of the Total Federal Funds (TFF) awarded (which is equal to TC), and
        - the applicable NICRA rate.
    - UCD shares the indirect costs with any subawards. If each subaward is calculating at 30% TC, we only calculate on UCD's costs. If, however, a subaward is requesting less than 30% TC, we add the difference to UCD.

2. Split Rates

The OR Budget Templates auto-calculate split rates, which occur when a project period spans two fiscal periods that have differing indirect cost rates. If you need to calculate them manually though, this is how you would do it for a 12-month period of performance:

1. Project Period Costs/# of project period months [i.e, 12 for annual project period] = One month of costs
    a. If the period of performance were shorter, say, 6 months, then you would divide by 6.

2. Months before end of Fiscal Year (FY) (before June 30th) = Months at Rate 1
3. One Month of Costs * Months at Rate 1 * Rate 1 = F&A costs at Rate 1

4. Months after start of next FY (after July 1st) = Months at Rate 2
5. One Month of Costs * Months at Rate 2 * Rate 2 = F&A costs at Rate 2

6. F&A costs at Rate 1 + F&A costs at Rate 2 = Cost for Project Year (PY)

Shortcut: *(Project Period Costs/# of project period months * Months at Rate 1 * Rate 1) + (Project Period Costs/# of project period months * Months at Rate 2 * Rate 2) = F&A costs for PY*

Example:
You are working on a budget for a research project with a start date of September 1, 2023 and end date of August 31, 2024. The appropriate F&A Rate is 60% for FY 2023-2024 and 61% for FY 2024-2025 with an MTDC Base. The MTDC is $300,000.

1. Determine one month of costs.
    - $300,000/12 = $25,000
2. Determine the # of months at the first rate.
    - How many months occur before 6/30/2024? 10.
3. Calculate the F&A Costs at Rate 1.
    - $25,000 * 10 * 0.6 [for 60%] = $150,000
4. Determine the # of months at the second rate.
    How many months occur on/after 7/1/2024? 2.
5. Calculate the F&A Costs at Rate 2.
    - $25,000 * 2 * 0.61 [for 61%] = $30,500
6. Calculate the F&A costs at both rates.
    - $150,000 + 30,500 = $180,500

Shortcut: ($300,000/12 * 10 * 0.6) + (300,000/12 * 2 * 0.61) = $180,500